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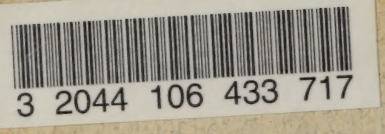
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The American Botanist

Devoted to Economic and Ecological Botany.

EDITED BY WILLARD N. CLUTE.

Volume III.

BINGHAMTON, N. Y.
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FOR THE PLANT LOVER

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THE AMERICAN BOTANIST

VOL. III. JULY 15, 1902. NO. 1

BOTANICAL NOTES FROM THE PHILIPPINES.

By BOYDEN NIMS.

Judging from illustrations of the plant one would naturally suppose that the Cocoanut palm does not bear until it get to be fifty or sixty feet high and then only six to twelve nuts at a time, but I have seen trees bearing nuts that could be reached by a man standing on the ground and I find that about thirty is the average number of mature nuts on a tree at one time, besides innumerable smaller ones. In addition to the nuts a valuable product of this tree is the sap from which an alcoholic beverage is distilled. The sap is collected by making an incision near the bud and hanging a joint of bamboo beneath to receive the exudation. Something like an acre in extent of the grove is tapped at a time, the different trees being connected just beneath the bottom leaves by bamboo poles so as to facilitate the emptying of all the bamboo pails by climbing only one tree. Two men work together collecting the sap. One climbs the tree and lowers the pails with a small rope and the other empties them into a larger receptacle, usually an earthenware jar. The shells, the outer husk and the the dead leaves of cocoanut are used for fuel, the shell being almost equal to coal for that purpose.

Besides the cocoanut there are a dozen or more palms common here, among them *Areca catechu*, a tree about eight inches in diameter and forty to fifty feet high that bears an orange colored fruit about the size and shape of a hen's egg containing a single seed, which is cut into slices and chewed by nearly all Filipinos the same as is tobacco by the Americans.

Growing among the cocoanut trees are various other trees and smaller plants including chicos, mangoes, bread fruit, guaves, langoles, cacao, bananas, oranges, limes, grape fruit and other fruits with which I am not familiar.

A peculiar thing noticed about all mango trees is that the limbs bear innumerable scars made by bolos, the natives probably believing that such treatment will cause them to yield more or a better quality of fruit. Oranges here are very small with thin tender skins that are easily removed without the aid of a knife or other instrument. They are eaten before the skin turns yellow and are very sweet, but not so juicy as those grown in America.

A dozen or more varieties of bananas are common, including the short, thick red ones that occasionally reach the United States from the West Indies. Some are eaten only raw, some only cooked, while others are good either cooked or raw. Some grow on trees four to five inches in diameter and five to seven feet high, others on trees a foot in diameter and thirty or forty feet high. The flesh of some is pure white and others a deep yellow. There is also a wide difference in the size, shape and flavor of the various varieties.

There seems to be no effort toward cultivating any of the fruits or vegetables of the Islands so as to improve their quality as is done in Europe and America. Farming is done here in a very primitive way, with the crudest of implements and on an extremely small scale. I have never seen a field of more than a couple of acres and none under a high state of cultivation. Most crops are simply planted and allowed to grow and mature as best they can.

Sweet potatoes, lima beans and some other vegetables raised in the United States grow wild over here. Gourds, squashes, pumpkins, cucumbers, watermelons and corn are cultivated after a fashion. Watermelons are small and insipid. Filipinos gather their corn after the husk has commenced to dry and roast on the cob over coals of fire at the markets and on the streets. I have never been in either the tobacco or the cane producing sections of the Island, but have seen both growing in gardens.

The natural order myrtaceae is well represented here, there being several species of *Eucalyptus,* including *E. globulus,* which was probably introduced from Australia, as I have not seen it outside of Manila. There are also several of *Eugenia,* including *E. malaconensis,* a tree about the size of our apple, which bears an edible fruit resembling very much our prickly pear in size, shape and color.

The mallow is another very large family and is represented by herbs, shrubs and large forest trees. An interesting member of it is a slender climber covered with delicate spines, deep cleft leaves and a bloom resembling very much that of our cotton. Another is a tree that gets to be nearly one hundred feet high and bears a five celled pod that opens like cotton and contains about thirty seeds, the size, shape and color of those of cotton. They are covered with lint of fine texture, but only about one-half inch long and not so strong as that of cotton. Most of the large trees seem to belong to the bean family and to this class belong most of the shade trees in the streets and parks of Manila.

Besides the large green bamboo used for buildings and various other purposes, which get to be four or five inches in diameter and about seventy feet high, there is another species, probably introduced from Japan, which is only two or three inches in diameter and twenty or twenty-five feet high. It is bright straw colored with some internodes, having one to six dark green stripes about a quarter of an inch wide, which gives the plant the appearance of having been painted.

Another interesting plant, probably a native of Japan, also is *Cananga ordorata,* from the flowers of which is made the perfume Ylang Ylang. There is a grove of them about two miles from Manila and a few trees in most of the public and private grounds of the city. The tree grows to the height of fifty feet and bears numerous flowers with six slender yellow petals about two inches long. The fruit resembles our papaw in shape and structure but is smaller and purple in color.

There are several species of fig here, but none, strange to say, of *F. carica* and none that resemble it very closely. Another member of that family, however, *Artocarpus incisa,* looks very much like it, especially the foliage at a distance of a few yards. The leaves of two species of fig are used by the Filipinos as a substitute for emery paper.

Two members of the Araceae wild here are a large climber, seen in nearly all conservatories in the United States, and *Caladium.* Here are some measurements I made of a specimen of the latter: Entire leaf, blade and petiole seventeen feet, tip of leaf to apex seven feet, blade four and one-half feet across, flow-

er stalk eight feet high, spadix one and one-half by seven inches, spathe when pressed open, one by one one-half feet. A smaller species of this plant is grown for the bulb which is a common article of food here.

Manila, P. I.

SOME VERMONT PLANT NAMES.

By C. F. Saunders.

In the course of a recent trip through the Green Mountain region of Vermont, I noted several plant names current among the people, which I do not find given in the books. In the hope that they may prove of interest to readers of The American Botanist, I append them here.

Rudbeckia hirta, bull's eye daisy; an interesting variant of ox-eye; a common name of *Chrysanthemum leucanthemum.*

Malva moschata, musk rose; an instance of the survival of the ancient use of the word rose, which far from being confined to the genus, *Rosa,* was extended in its meaning in old times to flowers in general. Similarly the word violet was used by ancient writers to include many plants of different sorts.

Vicia Cracca, wild pea; from its pea like fruit. This plant I found so abundant in some fields as to give them the appearance in July of being blanketed over considerable areas with purple sheets. The farmers seemed to think the presence of it improved the hay.

Brassica Campestris, kale; probably a survival of the word applied in England to other species of *Brassica,* a variety of cabbage being the best known.

Danthonia spicata, June grass. This grass appears in great abundance in grass fields which have been allowed to run out of cultivated stocks, and makes a fair hay if cut in June, whence the common name.

Rubus odoratus, mulberry, also thimbleberry. The latter name, also applied in some sections to the black raspberry, is obviously suggested by the form of the fruit, but how mulberry should become attached to this plant is an enigma. One man told me he thought the leaf had perhaps suggested a relationship to the mulberry.

Onoclea sensibilis, polypod or polypod brake. This name appears to be universal throughout Vermont, but I am completely at a loss to account for it. Perhaps some reader of this can throw light on the origin.

Osmunda cinnamomea, Buckhorn-brake; for what reason is not obvious, but possibly the woolly stipe has suggested to some rustic imagination the velvety covering of a buck's horn.

Pteris aquilina, hog brake; because, I was told, the young fronds are eaten by pigs. The word brake, meaning fern in general, is I believe in common use throughout rural New England, as well as much of New York State, and is no doubt an inheritance from the speech of old England, where in some countries, according to a writer quoted in Britton and Holland's Dictionary of Plant Names, the word fern was formerly not understood. This is analogous to the state of things in the Green Mountain region, where the term fern, if comprehended at all, is looked upon as a "citified" expression. Both brake and fern, however, are found in Anglo-Saxon in forms little different from their present day readings.

Philadelphia.

THE AMERICAN BOTANICAL CLUB.

The American Botanical Club is now fully organized and in the last thirty days has more than trebled its membership. In October the first annual election of officers will be held. The officers appointed to serve for the rest of the present year are as follows: President, Willard N. Clute, Binghamton, N. Y.; first vice-president, Charles C. Plitt, Baltimore, Md.; secind vice-president, Edw. C. Jellett, Philadelphia, Pa.; secretary, J. C. Buchheister, Griffins Corners, Delaware County, N. Y.; treasurer, Frank A. Suter, Lancaster, Pa.

In order to be of the greatest usefulness, the club has established an advisory council, consisting of specialists who will help students name their puzzling finds. Mr. C. G. Lloyd, Court street, Cincinnati, Ohio, will name any specimens of puff-balls, earth stars, birds-nest fungi and allied plants that may be sent him, and if members of the club who are interested in such things, will send him their names he will be glad to send them some of his

own publications on the subject. Mr. W. C. Barbour, Sayre, Pa., will name specimens of hepatics or liverworts. Prof. John M. Holzinger, Winona, Minn., has agreed to name mosses and Willard N. Clute will identify the ferns. Mr. James A. Graves, Susquehanna, Pa., will assist members in naming the sedges. Specialists in other difficult groups will soon be added to this list. Nearly all of those named have promised articles on the collection and preservation of specimens.

Members who send specimens for identification are reminded that the specialists are very busy people and should not be asked to name specimens out of curiosity. If one has done his best to name his specimens, without success then he will find the specialist glad to aid him. And if he would help the specialist to correct identification, he should send the best specimens he can find with any note he may think serviceable. Above all he will not forget to fully prepay postage and to enclose stamped and self-addressed envelope for reply.

The club has already issued a folder explaining its aims, copies of which may be obtained from the secretary. The constitution and list of members will soon be published. Members are expected to report upon their studies to the president at least four times a year. These reports will subsequently be published in the AMERICAN BOTANIST. The dues are fifty cents a year and all persons interested in plants are cordially invited to join. Address the secretary for further information or in applying for membership.

NATIONAL FLOWERS.

By MRS. BERTHA TAYLOR.

The national flowers of other countries have most of them been chosen on account of some historical association. Scotland has chosen the thistle as her flower. The story is this: During a night attack which some Danes were making on a body of Scots, a bare-footed soldier trod on a thistle and in his agony, gave a cry which aroused and saved the sleeping men. Well may the motto of the order of the thistle be "Nemo me impune lacessit." No one wounds me with impunity or in Scots dialect, "Take tent how ye muddle with me."

St. Patrick, the patron saint of Ireland at one time traveled as missionary over Ireland. One day while preaching he was anxious to explain the doctrine of the Trinity. The people failed to understand and refused to believe that there could be three Gods and yet but one. The holy man seeing a shamrock peeping from the green turf on which he stood, gathered it and showing it to then exclaimed: "Do you not all see in this simple little wild flower how three leaves are united in one stalk, and will you not then believe that there are indeed three persons and yet one God?" His audience easily understood the simple illustration. From that period the shamrock became the national emblem of Ireland and dearly is it loved by all the warm hearted, affectionate people.

Clovis, founder of the French Monarchy, married Clotilda of Bergundy, who was a Christian. She was very anxious that her husband should embrace her religion. Her persuasions were of no avail, however, until there came trouble between the Germans and the French. During a severe battle the French were nearly beaten when Clovis exclaimed: "O God of Clotilda, if thou wilt grant me this victory I will henceforth worship no God but thee!" His prayer was heard and the Germans were routed with great slaughter.

Clovis remembering his vow was soon baptised, and an old legend tells us that immediately after the ceremony an angel appeared to him and presented to him a Fleur de lis, to testify the approbation of heaven and his right to the French crown. Since that time France has been called the "Empire of Lilies" and the Fleur-de-lis or the old fashioned flower of our garden the Flower de luce, the national flower of France.

The longest and most bloody war that ever desolated England was named after the lovliest flower of our garden. The rose was used as the badge of the two parties, the red by one side and white by the other. The cause of the war was a dispute as to the rightful heir to the throne. It was carried on for many years until at the marriage of Henry VII. with Elizabeth of York the two rival houses were united. The roses then blended together became the national flower of England and were emblazoned on her arms and on her coin.

RUDBECKIA HIRTA.

The cone flower, (*Rudbeckia hirta,*) is said to be an introduced plant in this part of the country, but it springs up so spontaneously in the meadows, fits in so naturally with its usual environments, and is so thoroughly at home wherever it obtains a foothold that it is hard to realize it was not always found here.

Though classed as a "pestiferous weed" in some parts of the West, from which it is said to have come to us, it has never become so plentiful here as to be troublesome. Growing usually in the meadows, which are occasionally plowed up, it is exterminated before there is any danger of its becoming too plentiful.

If we might ascribe to a plant the power of being able to select an environment best adapted to set it off, surely we would have to admit that the Rudbeckia displays rare talent in that way, for the green grass of the meadows forms the most beautiful setting possible for the gorgeous yellow blossoms. If the Rudbeckia was a shade-loving plant, ferns would make a pretty background, but it loves the sunshine and the swaying grasses are its fitting accompaniment.

The name Rudbeckia was given in honor of the Swedish botanists Rudbeck, father and son, and the specific name hirta aptly describes the plant, as the leaves bristle with stiff hairs on both upper and under sides, and the stem and calyx as well.

The common name cone flower is also apposite. When the blossoms first open, the receptacle on which the small, purplish-brown disk flowers appear is almost flat and button-like, but as the blossoms grow older this receptacle expands into a very prominent cone-like structure, which gives a unique personality to the large, showy blooms.

Black-eyed Susan is another common name, the origin of which it might be interesting, but probably impossible, to trace. It must have been given by one who admired the black eyes of some lively Susan of the past. Common names are so apt to be circumscribed to limited localities, the wonder is how this particular one could have become so generally adopted.

Yellow daisy is another quite common name, but the use of this should be discouraged for the simple reason that the *Rudbeck-*

ia is not a daisy. To those addicted to using this name, we suggest that they make a comparison of the blossoms. Though both belong to the Composite Family, and so are cousins, a very superficial examination of the blossoms will show at least one difference, which is, that the disk flowers of the daisy are not arranged in cone-like fashion, like those of the *Rudbeckia.* It is just as easy to remember the name cone flower as it is yellow daisy, and the former name is so descriptive and appropriate it is hoped the latter will fall into disuse.

The blossoms of the*Rudbeckia* are supposed to be only of a very vivid, golden yellow color, but in reality they vary considerably in depth of tone, some being a light, lemon yellow and others ranging through gradations to a deep orange tint. It has been observed that flowers of particular tints are found in the same localities year after year.

In the summer of 1891 the writer found in a field in the town of Gates, near Rochester, N. Y., a few blossoms of *Rudbeckia hirta* which differed from the normal type in having a band of dark color at the base of the rays. In 1892 the same field was again visited and blossoms showing similar variations were found. That season a number of flowers with different markings were gathered, and the specimens formed a well-marked series. In some there were only faint lines. like pencilings, at the base of the rays; in others the lines were heavier and darker, the center line sometimes extending from the base to the apex of the ray; the rays of some of the flowers were all more or less shaded with brown; some showed a band of orange distinctly darker than the rest of the ray; the series culminated in specimens in which the band at the base of the rays was as distinct and as dark in color as in *Calliopsis.* As the band grew more distinct, the flowers decreased in size, those showing the darkest coloring being not much larger than th blossoms of *Calliopsis.*

The*Rudbeckia* takes kindly to cultivation and is an attractive feature in the wild garden. From a root accidently transplanted into a city yard, each year an increasing number of plants have sprung from the dispersed seeds, until they have become a distinctive feature, much admired by the passers by and prized by the possessor. Both flowers and plant seem to improve by cultiva-

tion, and we commend the *Rudbeckia* as worthy of introduction to any garden, and particularly to one where a corner is reserved for our wild flowers. I have found it difficult to make transplanted roots live, but from seeds scattered I have a vigorous plant which bloomed freely late last summer, and is very flourishing at the present time.--*Florence Beckwith in Vick's Magazine.*

HABITS OF THE DANDELION.

Let us take the history of one very common flower, the common dandelion. When it is in bud, the flower-stalk is short and lies on the ground. When the flower is ready to open, the stalk rises itself perpendicularly. What we call a dandelion flower is really a bunch of flowers, some hundred florets ranged on a flat disc. The outer rows of florets open first, then the inner and inner ones ending with the center ones. This lasts some days, and every evening about sunset the flower head closes up so as to protect the delicate florets from night dews and probably from night insects. I found, however, that I could keep a dandelion awake all night by exposing it to the blaze of an Argand lamp, which prevented it going to sleep. When all the florets have opened, the yellow corollas shrivel up, the stalk lays itself down on the ground so as to be out of danger and the seeds gradually mature. When they are ripe, the flower-stalk by some mysterious instinct becomes aware of the fact, and raises itself so as to stand up boldly in the wind, which seizes the seeds by their beautiful parachutes and carries them off to fresh fields and pastures new, and thus enables the plant to sow itself in any recently turned ground or in any other suitable locality.--*Lord Avebury* (*Sir John Lubbock*) *in Natures Notes.*

A NEW FORM OF BRUNELLA.

Francis Canning in a paper recently read before the Pennsylvania Horticultural Society mentions a new form of *Brunella* as follows: "There is a wild plant which of late years has adopted unusual circumstances and is an instance of where the vegetative organs become the reproductive. This plant is *Brunella vulgaris,* or self-heal. Apart from its usual haunts, roadsides and fields, it has established itself in well-kept lawns, where even the action

of the lawn mower has failed to eradicate it; in fact, it has so adapted itself to its new way of living as to succeed admirably. As it is unable to flower it reproduces itself by offshoots and roots from nearly every joint, and if left undisturbed will soon form undesirable looking patches. These new conditions have only occurred during late years, and its speedy eradication is advisable." The same form has been common for some years in the editor's lawn and two years ago specimens were sent to Prof. Peck the New York State Botanist. Since this form is best handled if given a name it is here proposed to call it *Brunella vulgaris* forma *nana*. It is a curious fact, not generally known that Linnaeus wrote the generic name *Prunella*, though all subsequent writers begin the word with a B.--*Willard N. Clute.*

EPIPHYTES.

The relation of these plants to their nutrient substratum is a very interesting question,because it enables us to see the particular way in which they obtain their food. Those that grow on the bark of trees—and they are numerous among Orchids—have a peculiar method of maintaining themselves. Their roots are adnate to the bark, exposed on one side to the air, and form projecting lines and ridges, ramifying in all directions, and often constituting a regular trellis-work cemented to the bark. These serve as instruments of attachment, but at the same time they also absorb nutriment from the substratum,the decaying bark upon which the plant is epiphytic. During periods of drought this absorption is suspended and the plant is practically dormant, but when the rainy season commences there is a long duration of wet weather, the water trickling over the surface from the collecting ground of leaves and twigs overhead, descending lower and lower, and bringing down not only tiny loosened particles of bark and decaying vegetation, but mineral and organic dust which has collected, dissolving all the soluble matter it finds on its way, and so reaches the roots and rhizoids in the form of mineral and organic compounds, chiefly the latter. In this way the requisite nourishment is conveyed to these curious epiphytes, whose period of active growth occurs during the rainy season.

The roots of epiphytal Orchids differ from those of terrestrial plants is being covered with a white papery substance, called the velamen, and the cells of the velamen serve the double purpose of condensing or absorbing aqueous vapour from the atmosphere, when any is present, and of protecting the underlying cells from excessive evaporation during periods of drought. In its absorptive character it is analagous with the outer cells of the bog-mosses (*sphagnum*) and *Leucobryum*, where the small chlorophyll-bearing cells are covered by large colourless cells, having very thin walls, which are variously perforated, and not only absorb water in liquid state, like a sponge, but also have the power of condensing it when in the form of vapour. A double function appertains to the roots of epiphytal Orchids, firstly to fix the plant to the bark and secondly to supply it with nutriment. When the tip of a root comes in contact with a solid body it adheres closely to it, flattens itself out more or less, develops papilliform or tubular cells, which grow into organic union with the substratum, and act as holdfasts. But if the root extends beyond the limit of the substratum it ceases to develop these clamp-cells, and hangs down in the form of a white filament. Many of these aerial roots do not become attached at all but hang freely in the air, often forming regular tassels.

The power of condensing aqueous vapour, and other gases as well, is of the greatest importance to these plants, for the bark to which some of them are attached is anything but a permanent source of moisture, and when this supply fails the only possible method of acquiring it is by condensing any that may be present in the atmosphere. When this supply fails the velamen dries up, and then acts as a medium of protection from excessive evaporation from the underlying tissue, and the plant then goes to rest. It must not be supposed that epiphytal Orchids grow in a perpetually moist atmosphere in the shady primeval forests. Many of them grow in only partially shaded spots, and in regions where periods of drought occur regularly every year, during which time there is a more or less complete cessation of vegetative activity, when the use of a protective covering for the roots is at once apparent. Most Orchids which are furnished with aerial roots perish if planted in soil in the ordinary way, but a few of them will occasionally bury their roots spontaneously in the earth, in which case they cease

to develop the papery envelope, when they exercise the same functions as in the case of land plants.

Some other plants besides Orchids exhibit this papery covering on their aerial roots, but more frequently these roots are furnished with a dense fringe of so-called root hairs, arranged in a broad zone behind the growing point, which are packed so closely together as to have a velvety appearance. These aerial roots never reach the ground or adhere to any substratum, and their function is entirely to condense and absorb the aqueous vapour from the air in which they are freely suspended, as has been proved by direct experiment. Plants which have this kind of root grow in places where the air is very moist all the year round, and where the temperature does not fall below the freezing point. Where the air becomes periodically dry they cannot exist, because they have no means of preventing excessive dessication, a contingency we have just seen to be provided for in the papery covering of the roots of epiphytal Orchids.

In many parts of the tropics, although the rainfall is heavy, there is generally an intermission of several weeks, and it is obvious that the epiphytes would wither and die if some provision were not made against such a contingency. The Bromeliads have reduced the evaporation from their leaves to a minimum, and made them hard and tough. Epiphytal ferns store up moisture in thick, leathery, and scaly rhizomes. And among Orchids we find the modified stem known as the pseudobulb a unique contrivance for retaining leaves through the longest drought. In some cases when the leaves are thin, they fall away altogether, and the plant is reduced to a bundle of green pseudobulbs, attached to its support by a few almost dry aerial roots, and thus it remains dormant until the return of the rainy season. The deciduous *Dendrobiums* form very good examples of this type. Sometimes the pseudobulbs are large and very fleshy, and the leaves are not deciduous, as in the case of *Oncidiums, Odontoglossums,* etc., while some seem to rely almost entirely upon their thick leathery leaves as a means of storage, as in the case of *Oncidiums* of the *Lanceanum* and *Jonesianum* groups. Some there are which have both thickened pseudobulbs and thick leathery leaves, as certain *Cattleyas,* etc. Conversely we find others which have no pseudobulbs, though the leaves are

more or less fleshy, as in *Masdevallia,* and others in which both features are practically absent, as in the *Pescatoreas, Bolleas,* and *Warscewiczellas,* a pretty sure indication that these plants have no long periods of drought to provide against. In short, they remain active almost throughout the year, and should be treated accordingly.

In a chapter entitled "Up in the Trees," Mr. Rodway has given a most graphic account of the epiphytes of Guiana. He states that the gloom of the forest is so great that very few plants exi on the ground, and in order to see the representatives of the pretty wood flora of temperate climes we must look overhead. In the recesses of the forest there is nought but bare trunks and leafless "bush-ropes." Even the epiphytes want light, and cannot exist without it, and where this precious influence is obtainable, they crowd every branch and twig, almost to the ground, and carry on the struggle for life right up to the tree tops. Monster arums twelve feet in diameter occupy the great forks, and throw down long cord-like aerial roots. Pushing those cords aside, the plants are barely discernible on account of the crowd of other epiphytes which surround them. Screens of creepers with festoons of handsome flowers, masses of *Rhipsalis,* pendulous branches of grass-like ferns, and thousand epiphytes on every branch obscure the view, and make it hard to say from whence a particular aerial root is derived. Some branches are occupied by dense rows of *Tillandsias,* which push everything else aside and take possession of the upper surface, where their vase-like circles of leaves form reservoirs of water against the time when little or no rain falls, which reservoirs are utilised by the beautiful *Utricularia Humboldtii.* Hardly a twig is free from epiphytes unless the gloom is too great, and these plants vary greatly in the amount of light they require. Some grow on the shady side of the trunks and never see the sun, others exist and thrive in places where we might expect them to be burnt up. Among the mosses and hepaticae grow tiny Orchids with almost microscopic flowers.

The study of epiphytes in their native surroundings is a fascinating subject, and the fact that they can exist in the way that many of them do shows a marvelous power of development in some past age. They are for the most part children of the moist forests, and

their very existence indicates the victory they have won in their struggle for light. They have literally been forced up into the trees, and have attained their present development by seizing positions of vantage with very little expenditure of materials. Commencing as humble occupants of the shady soil in the forest, it has been remarked that they have, during the course of ages, literally clambered up into the trees, striving after the light, and ever struggling against the precarious and fluctuating supplies of moisture and humus, inventing new absorbing and fixing organs, and contriving fresh devices for resisting threatened death from thirst or starvation, until at length their perilous career was crowned with success, and they formed aerial meadows and shrubberies. Their evolution is still reflected in the forest, where the simplest still lurk low down in moist shaded crevices on the tree trunks, and the more specialized ones are ranged successively upwards, until even before the tree tops are reached perfection is practically attained. --*Indian Gardening.*

NOTE AND COMMENT.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

RELATION OF ELEVATION TO THE SHAPE OF SEEDS.--Winged seeds are only useful when they start from a certain height. They occur in many trees-- ash, lime, maple, sycamore, pine, fir, beech and hornbeam--but not on low plants. Hooked seeds, on the contrary, would be useless on high trees or even on shrubs above the height of a horse or cow. They occur on docks, burrs and many other herbs but are not found on a single tree or even on any shrub. Edible seeds especially characterize low trees and shrubs loved by birds--such as the cherry, holly, ivy, yew, etc., etc.--*Nature Notes.*

SLEEP OF THE DAISY.--It is freqently stated in regard to the common ox-eye daisy (*chrysanthemum leucanthemum*) that its ray flowers fold over the disk at night, and opening in the morning earn for it the name of daisy (day's eye.) As a matter of fact, the ray flowers do nothing of the kind--at least in New York state

daisies. The habit of closing at night is reported of the English daisy which is quite a different plant from ours, and it is possible that the reputation given our plant has come by unconscious transference; though it would be interesting to know if the ox-eye daisy ever closes after the ray flowers are once spread.

THE STUDY OF PLANTS.--The unsolved problems of plant life are almost infinite. To make a collection, is no doubt interesting, but it is like making a library. What is the use of the books if you do not read them? What is the value of a collection if you do not use it? Aristotle said the greatest happiness of gods or man was to be found in the study of nature, and I think that one of the wisest of the many wise sayings which we owe to this distinguished man.--*Lord Avebury in Nature Notes.*

WHEN DO WINTERGREEN BERRIES RIPEN?--Most books that mention the subject say that the wintergreen (*Gaultheria procumbens*) does not ripen its berries in autumn, but that they ripen under the snow. Who can say whether this is correct or not? The same idea prevails with better reason regarding the partridge berry (*Mitchella repens*) though one author speaks of them as "lasting well into the winter." It is, however, no uncommon thing to find the vines at flowering time thickly covered with ripe berries, and it is a question how long one crop of fruit lasts; possibly for two years or more if the partridge does not claim its own in the meantime.

CATALPA LEAVES.--Britton and Brown's Flora describes the leaves of *Catalpa bignonioides* as strongly scented. This tree is quite abundant in the neighborhood of Philadelphia along water courses, but I have failed to notice any particular odor in the leaves. It would be interesting to know from the editor of THE AMERICAN BOTANIST or its readers what the experience of other observers has been.--*C. F. Saunders.* (The editor has carefully examined a large number of both *C. bignonioides* and *C. speciosa* and can find no marked odor in the leaves of either. Further observations are desirable, however. While examining the leaves another interesting fact developed in the way the trees bloom. The side toward the sun, so far as observed, invariably bursts into bloom first. No doubt this phenomenon is observable in most

flowering trees, but is never so noticable as in the sun-loving catalpa.)

SEEDS OF PITCHER PLANT WANTED.--Any reader of THE AMERICAN BOTANIST who can collect a small packet of seeds of the pitcher-plant (*Sarracenia Purpurea*) and send them to my address during the summer would do me a great favor. None grow in the vicinity and I should like to raise them nearer home if possible. Will return postage and favor in any way I can.—*Asa A. Schaeffer, Kunkletown, Pa.*

USE OF THE COMMON WOOD FERN.—The dealers in bouquets do a lively business in New Orleans in winter, for flowers are cheap and easily grown. The greenery that is mixed with the flowers, however, is not so readily produced it would seem, for a northern fern, no other than our common wood fern (*Nephrodium spinulosum intermedium*), is the principal thing used. Since this fern is not konwn to grow south of Tennessee I had the curiosity to visit a florist and make inquiry regarding it and was informed that the fronds are all from the New England States, being sent down by the millions in Autumn and kept in cold storage until wanted. Thus does bleak New England contribute to the enjoyment of a Southern winter.--*Fern Bulletin.*

THE CHAYOTE.—Much has recently been written about a new vegetable, the chayote (*Sechium edule*), commonly grown in Porto Rico, and now recommended for cultivation in the warmer parts of the United States. It does not appear to be known that the chayote is not entirely new to the United States, though it has long been grown in Louisiana and is common in the markets of New Orleans. It is known among the French as "*mirleton,*" while the Italian marketmen call it "vegetable pear." In shape it is much like a cucumber, largest at the blossom end. The plant is of the melon family, but unlike other species the chayote has but a single large seed in each fruit. The plant is a cucumber like vine that spreads rapidly and the root is perennial, but will not withstand frost. Hundreds of tons of the chayote are annually sent to the London and Paris markets from the warmer parts of the Old World.

EDITORIAL.

From many parts of the Northern and Eastern States, come reports of such frequent and copious rains that the cultivators of the soil despair of securing their usual crops. In the valley where the BOTANIST is published it has rained nearly every day for three months. Discouraging as such weather must be to the farmer, and the botanist, they may gain some small consolation from the reflection that this is a great year for nature's wild crops. Trees, shrubs and herbs are growing vigorously and getting a start that will not soon be lost. The autumn show of asters and goldenrods promises to be unrivalled and ferns are looking better than they have for years.

Those who intend to have a bed of wildflowers in their garden next spring may be advised that no time should be lost in looking up the plants in field and wood. All traces of such plants as the adders tongues, spring beauties and Dutchman's breeches, have probably disappeared, but the violets, trilliums, blood-root, Solomon's seal and others may still be found. Among wild plants that are best suited for shady gardens may be named the columbine, the wild lilies, the lungwort, mitrewort, coltsfoot, Jack-in-the- pulpit, hepatica and the anemones.

It was found impossible to get the illustrations for the proposed key to the wildflowers ready for this issue and as the key, when ready, will run through several numbers, it is thought best to postpone its publication for a few issues until all the matter is ready.

It is interesting to observe the different ways in which our two societies for the protection of plants go about the business in hand. The original "Society for the Protection of Native Plants," has already issued six leaflets calling attention to the plants that need protection and suggesting means of protecting them. The latest publication is a poster which is sent free to anyone who will place it in a conspicuous place. Membership in this society costs noth-

ing and the leaflets are sent to all who enroll as members. The secretary is Miss Maria E. Carter, Boston Society of Natural History, Boston, Mass. The imitator of this society, the "Wildflower Preservation Society of America," is approaching the subject by means of illustrated lectures held mostly in our larger cities. Membership in this society costs a dollar a year. The secretary is Charles L. Pollard, National Museum, Washington, D. C. Those who are actively interested in protecting the wildflowers will probably find one or the other of these societies to meet their requirements.

"It seems to us that the director of the Bronx Zoological Park is unnecessarily agitated over the threatened extinction of wild flowers within his domain," saye *Leslie's Weekly*. "He writes a long letter to the *Herald* complaining that in spite of all 'printed warning and appeals in three languages,' and the efforts of a corps of detailed watchers, the children will persist in picking the wild violets, the arbutus, the columbines, and other wild flowers growing in the park, and, in consequence, all these natural attractions are soon likely to disappear entirely. We fail to be moved by the director's pathetic plea for the wild flowers, our sympathies being rather with the children who are described as rushing to them with 'cries of joy,' and picking them 'as fast as their fingers can fly.' We doubt very much whether these 'raids' can be stopped, even if the police, the park employes, and the parents combine in the effort, and, what is more, we would not stop them if we could. Daisies, dandelions and violets will doubtless continue to grow in the vast spaces of Bronx Park for years to come, despite all the depredations of 'little hands,' and if they are finally exterminated in this way, as the director fears, why, let them go. What does it matter? Far better so than to institute a government of terrorism in the park for the repression or punishment of the little people who are charged with rushing with 'cries of joy' among the flowers."

Leslie's Weekly is quite right in this matter. There is some reason in preventing the public from mutilating the dogwood and other trees for their blossoms or uprooting choice wildings, but with other plants the case is different. Every year the Bronx

meadows are fairly blue with violets and yet not one of these showy flowers ever sets seed. The seeds are produced late in the year by inconspicuous flowers, and the early blue blossoms seem to be designed by nature solely for the children. Picking these flowers will not injure the plant in any way. It would seem far better to establish certain permits for picking the flowers, and detail some of the numerous park employes to superintend the picking, than to protect these useless flowers as is now done. The fact that certain flowers could be gathered by permission would certainly teach children that the others were not to be touched.

An applicant to whom we recently mailed a sample copy of THE AMERICAN BOTANIST sent back an order for the back volumes and a year's subscription with the remark: "I like this sample copy very much, it is so comprehensible to the amateur botanist" and another adds in renewing her subscription, "I find the magazine useful and interesting." These two letters have struck the key-note of our policy with regard to this publication. To make a useful and interesting magazine that is comprehensible to the beginner in botany as well as to the advanced student is our sole aim. To accomplish this we need an abundance of original notes and we hope our readers will have the BOTANIST in mind when preparing articles for publications.

The *Journal of Mycology* has again made its appearance. It was begun in 1885 by Prof. W. A. Kellerman and continued four years, then the U. S. Department of Agriculture issued three volumes after which it was discontinued. The new series is in charge of Prof. Kellerman and the initial number which contains 48 pages makes a very encouraging beginning. A portrait of Prof. C. H. Peck is given and there is a very complete and extensive index to North American Mycology. The journal will be issued quarterly.

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CONSPICUOUS AUTUMN FLOWERS.

BY PROF. W. W. BAILEY.

The last weeks of September are particularly rich in flowers. Nature appears to make one supreme effort and now "gathers up her robes of glory" as she prepares for the bleak and inhospitable winter. We do not find these showy flowers in the woods so much as upon their borders and in swamps. While the prevailing colors are blue and gold, the asters and goldenrods being largely displayed, we are by no means confined to these tints. The scarlet cardinal flower can still be found by water-courses, the most intense, if not the grandest of our wildflowers. A *Lobelia,* is the type of a very handsome family, known to every one in cultivation through the pretty blue trailing vine, *Lobelia erinus,* of hanging baskets. In the Middle States there is a large wild blue *Lobelia*--as handsome nearly, as the red one. Both are susceptible of cultivation and improvement.

In quite similar places one often finds the monkey flower or *Mimulus ringens,* tall and handsome with blue flowers. It belongs to the Figworts. Besides the goldenrod and asters, the Compositae present us various wild lettuces of the genus *Prenanthes,* recognized by their persistent cream-colored heads. But most brilliant of this family are the bur marigolds in swamps, the yellow and rosy coreopses and certain sunflowers. The latter grow in copses or along waysides. The bogs are made very gay with the splendid disks of these star flowers; indeed every Composte is regal--even though it be a weed.

And what, by the way is a weed? The question may be variously answered. Some define it as a plant which grows where it is not wanted, while Lowell tells us "it is a flower in disguise." Under either definition the same plant may be a weed or a prized acquisition according to circumstances. Some things that were

originally introduced into this country as ornaments have so increased and spread as to become nuisances; then they are weeds. On the other hand, some weeds of ours, transplanted to a region where it is rare, may become precious. We might multiply examples.

As everyone knows, our two species of gentian, the fringed and the box or closed, are characteristic autumn plants. So is the grass-of-Parnassus. This plant is found in wet or boggy places--with a large white flower suggesting an anemone, but prettily streaked with green. Curiously enough, it belongs in the Saxifrange family. This leads me to say an explanatory word concerning this matter of relationship. The non-botanist is often annoyed or confused by it, but after all it has a philosophical basis. The ancients resorted to the most obvious classifications--usually founded upon salient peculiarities. But even they recognized the fact that certain plants bore a close relation to one another. It is on this fact of relationship or blood affiliation, so to speak, that modern systems have grown up. Originally tentive, they yearly became more scientific and accurate. The anatomical structure, the morphology, the life-history enters more and more into consideration in determining a plant's position. Generally speaking, the more highly developed it is, the more widely differentiated or specialized, the higher it is regarded in the scale.

Providence, R. I.

SOME SURPRISES FOR COLLECTORS IN PORTO RICO

By O. W. Barrett.

The first surprise that awaits the Porto Rican plant hunter is the almost entire absence of a primitive or strictly virgin flora; for in only two or three limited areas of the Island will he find the surface clothed as it was in the time of the Arawaks. Over ninety per cent of the Island has been modified by the hands of man, as regards flora and probably three-fourths of the Island may be called domesticated. He would naturally expect to find palms and orchids in great abundance, but he will be negatively surprised. The palm flora is small, but according to Prof. O. F.

Cook, it is almost unique. And the orchids of Porto Rico are conspicuous by their absence.

He will meet many species of plants which occur in the Southern States and this may or may not surprise him, according to his experience. Accustomed to see *Diffenbachia seguine* as a green house pet, he will be surprised to see it flaunting its splendid dark green leaves at him, from the midst of some damp thicket. The leaves frequently have one or more small white spots on their upper surface, and it is these snowflake-like spots in the wild plant which have been bred up into the conspicuous blotches and streakes of the conservatory specimen.

If he looks carefully in swampy ground he will perhaps find a most peculiar plant of the *Amorphophallus* type. This plant which, by the way, has just been sent to the New York Botanical Gardens, and which may prove to be a new species, possesses one of the most interesting forms of leaves I have ever seen; the blade is neither compound nor palmate, but a peculiar crazy mixture of both, and in addition the intravenal tissue is thrown up into ridges and filled with holes of various sizes. The petiole is a study in itself; its surface seems to shine with an iridescent lustre derived from metallic-looking cells just beneath the epidermis; the surface is blotched and marked with light and dark grays and browns, like the skin of an adder; and apparently not content with this scary display, the plant feebly defends itself with irregularly placed and almost harmless conical spines. Sacrilege though it may be, the large flat corm of this wonderful plant is dug and eaten by the half-starved half-breeds of the interior. Its flower seems to be unknown, even to the natives, but we hope a little cossetting and the judicious use of phosphoric acid will enable us to see a great treat in the flower line within a few months.

Pancratium caribaeum grows wild along the sea-beach and even in sandy fields back from the coast. Its flowers are four to six inches across and exceedingly fragrant. Florists list it at about ten cents per bulb. *Hippeastrum equestre*, the Barbadoes lily, is one of our commonest weeds. A field of these flowers in bloom in the early spring is surely a magnificent surprise. For all around, rough-and-tumble, catch-as-catch-can vitality, I believe this bulb cannot be beaten. Plow them up, mangle them

with the harrow, and let them bake on top of the soil throughout the dry season, and yet when it comes time for them to display their red flags they will do so just as if nothing had happened.

Tree ferns at sea level are another surprise; and of three species at that. *Tabernaemontanea coronaria* has escaped from cultivation. The Amazon lily is also escaping. And I have seen *Crinum amabile*, a three-dollar bulb from Sumatra growing luxuriantly in a road side thicket. Our sister Island, Jamaica, abounds with ferns of all families; but I doubt if the collector could find one-half of her five hundred or more species on this Island.

Porto Rico.

THE FRUIT OF THE MAY APPLE.

The May Apple (*Podophyllum peltatum*) seems to have been so named because it ripens in July instead of in May. In many a youngster's mind the season for May Apples and Sunday school picnics are inseparably associated for no wide-awake boy ever spent a whole day in the woods without investigating every likely object in the vicinity which of course includes this fruit. On the subject of its edibleness Mr. C. F. Saunders writes entertainingly in the Philadelphia *Record* as follows:

"But the great mid-summer crop of the woods is the May apple yield. Everybody knows this common plant in the spring, when the appearance of the umbrella-like leaves is the delight of the children. As summer advances the foliage turns yellow and becomes bedraggled, and the pear-shaped fruit, about the size of a butternut in the hull, grows to be the prominent feature. This is now ripe.

Though possessing a rank, disagreeable odor when green, this fruit at the time of maturity is delightfully fragrant, with a perfume hard to define, but combining the characteristic smells of cantaloupes, summer apples and fox grapes. Two or three brought in and laid on the mantel will perfume the whole room.

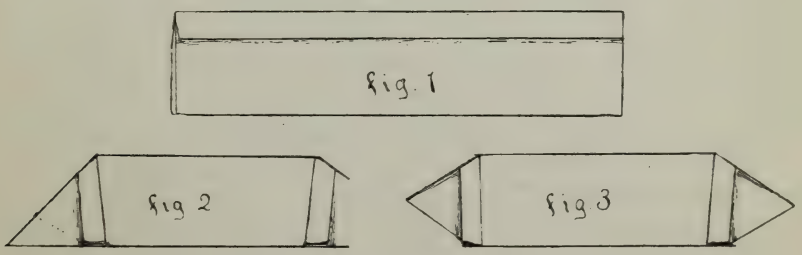
As to the edibleness of the fruit, that is a matter of taste; some people loathe it, while others are very fond of it. It ought not to be condemned, however, on the evidence of unripe specimens.

but should be accorded the advantages of a judgment based on mature fruit. When ripe the little apples are yellowish in color and drop into the hand when touched. The outer rind is rejected by connoisseurs, the portion eaten being the translucent, jelly-like mass that encloses the seeds. On a hot day this is found to be a refreshing acidulous morsel by many a thirsty rambler. New England housewives sometimes pickle the green fruit."

In the Tropics there is a highly prized fruit known as the Guava (*Psidium*) which although not closely related to the May apple, is in size, shape, color, structure and taste a very good likeness of it. Guava "dulce" is a famous product of this fruit. Possibly we may yet have May apple dulce.

A HANDY SEED PACKET.

Whether one happens to be far afield or only in his own door-yard the necessity for a packet that will hold seeds is often felt. An old envelope will do in a pinch, provided one happens to have it at hand, but a much better article can be quickly made by one who knows how, without the use of scissors, paste, pins or twine, that will securely hold the very smallest seeds.



A HANDY SEED PACKET.

Fig. 1, preliminary folds; fig. 2, corners folded back; fig. 3, completed packet.

This is how it is done. Take a sheet of paper about six by eight inches in size and fold in the middle, so that the two eight-inch edges are parallel. Next fold these edges over twice, making about a quarter inch fold each time, (fig. 1.) Then make a diagonal fold across each end by bending the upper folded corners

backward as in figure 2, after which make a third fold at right angles to the second (on the dotted lines in figure 2) push the free end under the first fold (fig. 3) and the packet is complete.

This packet has the merit of being instantly made, when desired, wherever a piece of paper can be procured and if properly constructed will hold without spilling flour, dust or the finest seeds. It is worth the while of anyone who does not know how, to get a sheet of paper and learn to make this packet. There are hundreds of occasions when the knowledge will be useful--W. N. C.

ORIGIN OF SPECIES BY MUTATION.

Three kinds of evening primroses occur in Holland, all three introduced from America about a century ago, but since escaped from cultivation. The youngest of the three or rather the one most recently introduced, and at the same time the most rare, is the large-flowered evening primrose, described at the beginning of the nineteenth century by Lamarck, and named after him *Oenothera Lamarckiana.* It is a beautiful, freely branching plant, often attaining a height of five feet or more. The branches are placed at a sharp angle with the erect stem and in their turn bear numerous side branches. Nearly all branches and side branches are crowned with flowers, which, because of their size and bright yellow color, attract immediate attention, even from a distance. The flowers, as the name indicates, open towards evening, shortly before sunset, and this so suddenly that it seems as if a magic wand had touched the land and covered it with a golden sheet. Bumble bees and moths, especially those of *Plusia gamma* and of *Agrotis segetum,* are the principal visitors. During the hot weather the flowering period is limited to the evening hours. In daytime often nothing is to be seen but faded and half-faded flowers and closed buds. Each flower bears a long style with four or more stigmas, which protrude at some distance above the eight anthers, and would therefore, as a rule, not be fertilized without the help of insects. When the flowers, including their apparent stem, the calyx tube, drop off, there remains behind a perigynous ovary, which finally becomes a capsule. At first green, it becomes brown on ripening and finally opens with four val-

ves, setting free the seeds. A stem with ten to twenty, or even thirty or forty, capsules is not rare, nor consequently a plant with a hundred or more fruits. And since each fruit contains more than a hundred seeds it would be quite possible for a plant of this species to reproduce itself several thousandfold, provided all seeds could germinate and grow.

It is this plant, *Oenothera Lamarckiana,* which exhibits the long-sought peculiarity of producing each year a number of new species, and this not only in my experimental garden, but also when growing wild. But in the latter case the new species have as a rule but a very short lease of life; they are too weak and too few in number to survive in the struggle for existence with the hundreds and thousands of their fellows. In the experimental garden, however, they can be recognized at an early stage, and with especial care may be isolated and cultivated. It is thus that in the experimental garden we are readily able to see that which, among wild-growing plants, is lost to observation.

The new species vary but little from the old. An inexperienced eye detects no difference. Only a careful comparison shows that here we have to deal with a new type. There are some, for instance a dwarf species, and species with a peculiar close crown (*O. nanella* and *O. lata*), which at once attract our attention, because they are short of stature. Again, some are more slender and delicate, others low and unbranched, or robust and tall. A difference may be detected in the shape of the leaves, their color and their surface. The fruits vary in the same manner; sometimes they are long, sometimes short, sometimes slender, sometimes stout. The more one observes these plants, the more differences one sees. Gradually it becomes apparent that here we have to deal, not with a chaos of new forms, but rather with a series of sharply defined types. Each of these types originated from a seed produced by the parent species, growing wild and fertilized in the usual manner, or growing in the experimental garden and fertilized artificially with its own pollen.

Here then we have our first result. The new species originates suddenly, without preparation or intermediate forms. But they do not differ from the old species like an apple from a pear, a pine from a spruce, or a horse from a donkey. The deviations

are far smaller. But every one knows how difficult it is to distinguish the common oak from *Quercus sessilifora,* or the lime tree from *Tilia grandifolia.* Yet these are forms which by the disciples of Linnaeus are recognized as true species. And what botanist has not been entangled in the species of *Hieracium,* or who is able to recognize at first sight the closely related forms of *Cochleria?*

Because of the dying out of intermediate forms, more ancient species may be widely separated. On the other hand, more recent species, whose ancestors are still alive, may form narrow groups because of and with these surviving ancestors. Good illustrations of the latter are yielded by roses, willows and brambles as shown by the facility with which the closely related forms can be cross-fertilized, as well as by the great trouble the numerous bastards cause in determination. Such genera are found everywhere in the plant kingdom; the gentians of the Alps, for instance, or the *Helianthemums,* which with us seem to be composed of fairly distinct types. Everything indicates that in these cases the species are of more recent date, and that only through the dying out of intermediate forms the differences between the remaining ones have attained that degree of distinctness which so greatly facilitates the separation of the other groups.

In this regard the *Oenotheras* agree exactly with what may be observed in nature. Recent forms group themselves around the mother form with minute, hardly perceptible gradations.

Once formed, the new species are as a rule at once constant. No series of generations, no selection, no struggle for existence are needed. Each time a new form has made its appearance in my garden, I have fertilized the flowers with their own pollen and have collected and sown the seed separately. The dwarf forms produce nothing but dwarfs (*O. nanella*), the white ones nothing but white ones (*O. albida*), the *O. gigas* nothing but *O. gigas,* the red-nerved ones nothing but corresponding specimens. But a single form made an exception. This was the small *O. scintillans,* the seeds of which produced but a percentage of *scintillans* plants, but here this inconstancy is and was as much the rule as the constancy of the other species.

As an example I may cite *O. gigas* The plant is as tall as

O. Lamarckiana but has a more robust stem, denser foliage, a broader crown of large, widely opening flowers and stouter flowering-buds. The fruits attain but one-half the length of those of plants of the mother species,and consequently contain fewer seeds. But the individual seeds on the other hand, are rounder fuller and heavier. This type originated in my cultures of 1895 as a solitary specimen, which at first was overlooked. At that time I desired to hibernate some plants, and in the latter part of the autumn chose for that purpose twelve of the strongest and best developed. It was only in the following summer, when the plants began to flower, that I noticed that one plant showed differences, the importance of which I did not fully realize until the fruits, on ripening, became much shorter and stouter than ordinarily was the case. It was only then that I placed the raceme in a bag so as to prevent fertilization with other pollen. Afterwards this seed was collected separately and in the spring of 1897 sown in a flower bed between other beds sown with seeds of the normal *Oenothera Lamarckiana.* Immediately subsequent to germination no difference was apparent, but when the third and fourth leaves unfolded it suddenly became evident that a new species had originated. All plants differed from their neighbors, were more robust and bore broader, darker leaves. Though two to three hundred in number, all evidently belonged to one distinct type. Not having at the time, paid special attention to the mother plant, I was unfortunately unable to compare the latter with the type at this age. But when, during the summer, first the stems and afterwards the flowers and the fruits, made their appearance, the agreement became perfect. All specimens closely resembled the mother, and together they formed the new species, *Oenothera gigas.* This species therefore was at once constant, even though it found its origin in but a single specimen. Evolved with a sudden leap from the mother species, differing from it in general appearance as well as in the character of its various organs, it remained unchanged. It was no rough cast which selection had to correct and polish before it could represent a distinct form; the new type was at once perfect and needed no smoothing, no correction.

My other species originated in the same manner, suddenly and without transitions. We may therefore assume that species, when growing wild, do not appear gradually, slowly adapting themselves to existing conditions, but suddenly, entirely independent of their surroundings. Species are not arbitrary groups, as Bailey, and with him many others, believed should be deduced from the theory of descent, but sharply defined types, unmistakable, for one who has once seen them.

Each species is an individual, says Gillot, having a birth, a lease of life, and an inevitable death. From the moment of birth until the time of death, it remains the same. Only when taking this point of view can we reconcile our daily experience of the constancy of species with the theory of descent. This is fully confirmed by the results of my experiments.

If species originated gradually, in the course of centuries, their birth could never be observed. Were it so, this most interesting phenomenon would forever remain hidden from us. Happily it is not so. Each species as soon as born takes its place as peer in the ranks of the older species. This birth may be directly observed. One can even collect the seeds in which the new types are hidden, and one can observe the first steps in the development of these types. Literally the new species originates at the time of the formation of the seed, but it is born only at the time of germination. But at this period it is not recognizable as such; this only becomes possible after the first leaves have unfolded. The plant can then be photographed, and in this manner we may preserve the type as soon as it becomes discernible and recognizable. In fact, one can study the birth of a species as readily as that of any individual, be it plant or animal.

Any advance in our knowledge depends on the possibility of seeing species originate. Of course this does not refer to present species. Such a thing would be as impossible, as absurd, as expecting to witness the birth of an individual already inhabiting the earth. The species living at present are too old. But they may give rise to new ones. There seems to be sufficient reason for suspecting that this is happening at this very moment, and in our immediate surroundings, only we are not aware of it. Such cases must therefore be searched for with great care and patience.

Once found, they must be carefully and extensively studied. The one case which I have mentioned here shows sufficiently the great treasure of new facts which lies within our reach. All that is necessary is to overcome the first difficulties.--*From an article by Prof. Hugo de Vries in Science.*

THE AMERICAN BOTANICAL CLUB.

When the charter of the American Botanical Club closed, on the 16th of August, there were more than half a hundred members on its list. Around this nucleus there is certain to be formed a strong society that will prove its right to exist by many contributions to our knowledge of the plants.

A friend of the club has offered two prizes to be awarded in June, 1903, for the best report submitted by a member. To this the publishers of the AMERICAN BOTANIST add three more making a total of five. The first prize will consist of a copy of either Gray's, Wood's or Britton's Manual as the winner may select. The second prize is a copy of "Botanizing" by Prof. W. W. Bailey. The other prizes are three yearly subscriptions to this journal to be awarded to the three next best reports. All reports received up to June 15, 1903, will be included in the contest. The committee of award will consist of the president of the club and two other botanists to be selected later. Reports will be judged according to the following value: Originality of subjects 15, method of treatment 10, literary style 12, neatness of report 3. The reports may deal with any subject in botany that has interested the writer and each member may submit as many different reports on different subjects as he likes; all will be entered in the competition. It is probable that a report detailing the study of a single species will be most likely to be a prize winner, because this phase offers the most opportunities for original investigation, but it is possible that a study of some point in ecology, in the distribution of plants, or in the structure of plants will carry off the palm. Reports are to be submitted to the president in the usual way and are to become the property of the club.

An article of the constitution provides that when there are at least five members of the club in one locality they may form a

local branch. These branches are to be self-governing. Each will be named for a flower or some noted botanist to be selected by the members of the branch. Since there are several cities in which we have more than five members, it is expected that we will soon have several branches of the club. The club now has a membership in fifteen states.

NOTE AND COMMENT.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

WINTERGREEN BERRIES.--In the neighborhood of Philadelphia these little berries (*Gaultheria procumbens*) ripen in September and October, and they are sold on the street fruit dealers' stalls at the same time with chestnuts. I gathered a couple today (September 7) evidently of the new crop, about three quarters red and one-quarter white.--*C. F. Saunders*

TUBER BEARING LABIATES--Referring to your note on this subject in the May issue of THE AMERICAN BOTANIST, I would mention *Scutellaria parvula* as an American tuber bearer in the mint family. It is a small plant, 4 or 5 inches high. At the one station where I have gathered it near Philadelphia, the root stock is sometimes beaded with a succession of the small tubers, reminding one of a section of a rude necklace.--*C. F. Saunders.*

REDUCTION OF SPECIES IN ANTENNARIA.--The lines separating the species in certain genera have been drawn so taut in recent years that they have reached the point of rupture. It has often been prophesied that many of the "new species" would turn out to be founded upon insufficient characters and this now seems coming true. Mr. Elias Nelson in the *Botanical Gazette* for August asserts that a large number of what have been described as distinct species of *Antennaria* are not even worthy of sub-specific rank. Mr. Nelson's observations have been carefully made and his conclusions will strike the majority of botanists as very sensible.

UNUSUAL PLANT NAMES.--A glance through any extensive list of plant names will disclose many names that apparently bear

no relationship to the plants that bear them. A further study, however, often brings out some obscure connection between them. One of the most prolific sources of astonishing common names is found in the attempt of the public to anglicize the scientific terms. To this is probably due the name coptide applied to the gold thread (*Coptis trifolia*) but how the trilliums become known as Benjamins or the round leaved wintergreen (*Pyrola rotundifolia*) acquired the name of copalm is not so clear. In C. H. Dodge's "Flora of St. Clair Co., Mich.," a large number of these curious names appear.

The New Jersey tea (*Ceanothus Americanus*) is also called sprangles; the leatherwood (*Dirca palustris*) is known as wicopy, and the chicory (*Cichorium intybus*) as bunk. Universe-vine is a new one for the bear-berry (*Arctostaphyllos uva-ursa*) and crackers for the huckleberry (*Gaylussacia resinosa*). The wintergreen (*Gaultheria procumbens*), which has its full share of intelligible names, has also to its credit jinks, drunkards, pippins and red pollom. More light upon the origin of these names is greatly desired. Can any of our readers help us?

Promoting the Usefulness of Parks.--The enjoyment of the populace in large country parks and forests, can be greatly promoted by allowing the picking of flowers and berries; and this permission may be safely given, provided the plants are not dug up by the roots, either by design or through carelessness. So valuable is this privilege, that it is better to run some risk of the extermination of desirable growths, than to prohibit picking. It is of course possible to keep sowing the plants which are most apt to be picked, like the columbine, wild geranium, anemone and blue violet. Some fragrant things ought to be carefully raised in the parks expressly for the enjoyment of the people who discover them appearing in the season.--*President Eliot of Harvard in Park and Cemetery.*

Birds and Berries.—Apropos of Almon N. Rood's query in the April number of this journal as to what birds eat the berries of the winter-berry (*Ilex verticillata*) the following upon British birds and berries from *Nature Notes* will be be of interest. "From personal observation I have found that song thrushes and the rarer missel thrushes eat freely holly berries, a small tree in

our garden being stripped of its fruit in the mild open weather of late autumn. The missel thrush also likes yew and rowan (mountain ash) berries. Black birds sink with outstretched wings upon bushes too slender for comfortable perching and devour the black berries of the bay and hard unfleshy laurustinus berries. The rose hips as soon as soft, hang sucked flat by the birds. In autumn too, I was surprised to see a robin eating myrtle berries." Another correspondent mentions wood pigeons eating the berries of the ivy.

What is the Jackson Vine?--In the Southern United States the make up of the Christmas decorations differs in several particulars from those farther North. The holly takes the place of spruce and pine, and the club-mosses or running pines (*Lycopodium*) are seldom seen. For festoons, a vine called Jackson vine is used. It has lanceolate, evergreen leaves and seems a very good substitute for the running pine. The botanical name for the vine is apparently not very well known. In appearance the plant is much like a *Smilax*. Britton and Brown credit the matrimony vine (*Lycium vulgare*) with the name of Jackson vine, but this is not the Southern plant of that name. Can some of our readers throw more light on the subject?

Rosette Plants and Protection From Cold.—Rosette plants exhibit some interesting adaptations for protection from cold, such as the geotropic curvature of the leaves and the development of red color. If a leaf of a rosette of smooth mullein (*Verbascum blatteria*) or of the common teasel (*Dipsacus sylvestris*) be examined late in October, it will be seen that it is pressed tightly against the surface of the ground and if the entire plant is dug up and placed in a collecting case for a few hours the leaves will be found turned downward so far that they are parallel with the tap root and form a cup around it. During the same season of the year the leaves of many rosette plants are quite red or purple. This is due to a substance known as anthocyan. It is the same red coloring matter that is present in the unfolding leaves and twigs of red maple (*Acer rubrum*) and soft maple (*Acer saccharinum*). Anthocyan changes some of the rays of light, which pass through it into heat, and of much importance in

the economy of the plant during the cold days of autumn and spring.—*Ohio Naturalist.*

THE FLOWERS OF CRYPTOGAMS.--One of the popular distinctions between the flowering plants and the higher crytogams, is that the latter have no flowers. In the recently issued "Organography," however, Goebel extends the term flower to cover tuch structures as the fruiting spikes of *Equisitum, Lycopodium, Selaginella* and others, a flower being defined as "a shoot beset with sporophylls."

COLOR NOT ALWAYS OF USE.--It is generally conceded that the colors of flowers have been developed as an aid to cross-pollenation, being so many advertisements for the bee--and in like manner the colors and juicy pulp of berries have been construed as aids to the dispersal of the seeds, by being attractive to birds and mammals, there are, however, numerous berries, both juicy and of brilliant color, that seem never to appeal to the folk in fur or feather. Such are the berries of twisted stalk (*Streptopus roseas*), *Clintonia* and many others belonging tothe lily family. These hangs on their stems ungathered until wind and weather sow them in the surrounding soil.

FORMATION OF LEAVES IN WATER--Many water plants bear two sorts of leaves, those under water being usually thinner and much more divided than those produced in air. No doubt many have wondered as to the cause of this, for it will not do to say simply that the one sort differs from the other because produced under water. We must know the reason why. It has been frequently suggested that the shape of the sub-aqueous leaves is due to a lack of light, but according to the *Botanical Gazette* an elaborate series of experiments made by W. B. McCallum upon the mermaid weed (*Proserpinacea palustris*), has shown that aside from retarding the growth of all parts of the plant, a lack of light has no effect. No matter under what conditions grown the aerial leaves were broad and nearly entire, while those under water were always of the well-known dissected form. It was found possible to change the leaves from one form to the other in four internodes of growth, and to produce stems with several zones of each form alternating. Further experiments proved that the change

in form is not due to nutrition, temperature or salts and there is still some doubt as to the real cause of the changes, but it now seems settled that it is not due to lack of light.

New Use of White-Wood.--According to the *Medical Record,* the white-wood (*Liriodendron tulipifera*) is an efficient cure for the tobacco habit. The part used is the inner bark which may be chewed fresh, or powdered and mixed with liquorice and sugar and formed into tablets to be taken whenever a craving for tobacco is experienced.

The Number of Cactus Species.--Many people who have been acquainted only with the prickly pear and the cholla cactus of the plains, perhaps to the detriment of their epidermis, will be surprised to learn that over one thousand valid species exist, to which more than three thousand names have been applied by botanists and horticulturists.—*West American Scientist.*

Use of Mosses in Millinery.--Cora H. Clarke notes in the September *Bryologist* that two species of moss have been found in use in Boston by milliners. One species, conjectured to be *Hypnum purum* of Europe, is made into a sort of flat braid three inches wide and sells for twenty-five cents a yard; the other is formed into a sort of cord half an inch in diameter which looks like green chenille. This sells for ten cents a yard. The species used seems to be another foreigner, *Neckera crispa.*

The California Poppy.--More than one student has wondered at the unpronounceable botanical name of the California poppy *Eschscholtzia,* so guiltless of any relationship with the Latin from which most botanical names spring full-fledged. It appears that we owe it to the name of the first botanist who classified it, one Eschscholtz. Yet he was not the first discoverer, for centuries before, the Spanish mariners, even while far out at sea, had their attention arrested by what appeared to be sheets of golden flame spread over this unknown land towards which they were sailing. And when they came nearer they saw that this strange phenomenon was caused by millions upon millions of these golden flowers, "blazing along the Pacific coast, embroidering the green foot-hills of the snow-capped Sierra Madres, transforming acres and acres of treeless plains into royal cloth of gold."--*New Century*

STERILITY OF HYBRIDS.—Scientific men are fond of throwing it up to practical people that they are behind the times; but devotees of science are often among the crowd that live in glass houses and yet throw stones. Horticulturists have long ago learned that hybrids are as fertile as their parents; and orchids, gesneriaceous plants, and many other classes furnish abundant evidence. But that hybrids are sterile, or generally sterile, is still a doctrine on which many pretty "theories" are founded by leaders in science.—*Meehans' Monthly.*

THE TWO FORMS OF VIRGINIA CREEPER.--The typical Virginia creeper (*Ampelopsis quinquefolia*) has its tendrils tipped with sucker-like discs, by which the vine is anchored firmly to its support. This form is supposed to be the common one in Eastern America. Further west there is a form without discs which by some is considered a distinct species and by others only a variety of the first. This form is called variously *Engelmanni, laciniata, hirsuta* and *vitacea.* Additional observations are necessary to define the exact ranges of each form.

ERRONEOUS IDEAS OF BOTANY.--I will tell you where, in my opinion, a mistake is made now-a-days. Children in schools are led to think that they have mastered botany when they have gone through "Botany in Fourteen Weeks." After the majority leave school, not proceeding to higher schools, they think no more of the study but relegate it to the limbo in which rest the multiplication table and common fractions. A single flower or two, well taught in regard to every organ and adaptation to its circumstances, would be worth the whole of the text books. I often come across young people, in my rambles for flowers and rarely miss a chance of having a talk with them. Too frequently I hear with an inward groan the remark: "Oh! I studied botany when I was at school." That settles the matter and they look with pitying eye on me when I say that I am studying botany now and hope to know something about it some day. One graceless young "future president" had the sympathy to remark: "I suppose they did not teach botany in your school"--*Robert Blight, Norristown, Pa.*

EDITORIAL.

At first thought, it seems preposterous to assert that a single seed has within it the possibilities for a whole summer of original investigation; but the longer one considers the matter, the more certain it becomes that this is so. As soon as the cotyledons have shaken off the seed-coats the mysteries begin. The garden lettuce is ordinarily an unattractive plant that seems to grow only to be eaten, but when one has seen a bed of lettuce seedlings asleep with every pair of seed leaves folded together, the plant has a new charm for him that does not come by way of the table. The thought that Tennyson addressed to the "Plant in the crannied wall" must ever recur to the speculative botanist and spur him on to new endeavors. We do not care so much why or how a plant got its name; our queries are, how did it come to be; why is it as it is; and to what purpose are these various modifications of stem and leaf and flower and seed vessel. No one can find this out about a single plant in any one summer, nor yet many summers; but he can come nearer to the truth than he is at present. It is not necessary to go to distant lands for such study--the lawn, the garden, the weedy roadside furnish material in plenty--but just as a strange plant in the midst of familiar ones attracts the most attention, a new plant is most likely to prove best for study. At this season when every field and thicket is full of seedpods, our readers should not forget to gather seeds of the more attractive flowers for exchange with distant botanists. Few phases of botany give more pleasure than the rearing of a strange plant from a seedling to maturity.

The article upon the origin of species by mutation reprinted in this number is of value in confirming a theory previously held by many botanists, among whom the late Thomas Meehan was one of the foremost. The deeper we go into the subject, the more certain it appears that all species have been formed by a succession of bounds rather than by slow gradations; but it is to be assumed that the new species formed differed more widely from the parent than the segregates of *Œnothera Lamarckiana,* are

known to do. We should be inclined to call these latter segregates, forms, and to deny them even the rank of a sub-species. It seems quite probable that every good species is like *O. Lamarckiana,* constantly throwing out these embryo species; indeed the whole theory of evolution is based upon this supposition. Darwin was of the opinion that the changes were small and successive; the later idea is that they are much greater and the forms fixed when once a change is made. In either event, as shown by the article in question, unless the conditions are favorable, the tentative species perish and leave no sign. The difference is principally that the Darwinian theory conceives of the plants varying, because of influences from the outside, while the new one assumes that plants constantly vary but that outside influences are necessary to preserve the variations. It seems that here we have a very good criterion for the determination of species. If any of these new forms could live and thrive under normal conditions, we would call them species; if not, then they would be classed as varieties or forms. None of these segregates of *O. Lamarckiana* were able to form separate colonies, even in soil untenanted by the original species. It would occur to most students therefore, that they are merely equivalent to what are called "forms" in America. The whole subject is one of much interest, and botanists may find in the cultivation of other mutable species, a field for much original research.

The official organ of the "Wildflower Preservation Society of America" makes a bad matter worse by explaining that as soon as this second society was organized, it invited the original Boston Society to become one of its local branches! Some people will be inclined to wonder if the American Forestry Association and other societies received a similar invitation.

The Plant World, Washington, D. C., offers a prize of $10.00 for the best cover design for the magazine submitted before Nov. 1, 1902.

Mr. C. G. Lloyd has just issued a 44 page pamphlet illustrated with 80 figures on the Geasters or earth-stars of North America.

It is safe to say that no single student of the fungi is doing more than Mr. Lloyd to advance our knowledge of this group of plants, He has recently erected a new four story building of brick and stone in Cincinnati to be used as a museum and library which is estimated to be capable of holding nearly five hundred thousand specimens of puff-balls and allied plants.

Almost without exception our out-of-door books have been written in the Northeastern States and treat of the features of that part of the world written from the Yankee point of view. In "Next to the Ground" by Martha McCullough Williams we get a view of the seasons as they pass in the South, by one who has grown up in such surroundings and is thoroughly familiar with what she writes about. In the "foreword" the author says that "as one star differeth from another in glory, so does one field or wood or hedgerow differ from another." How much her fields differ from those of the New England and Middle States one perceives before he goes very far in the book. The very methods of tilling the soil and gathering the crops are different. In the chapters on "Ploughing," "Shooting" and the like, the author shows a knowledge of the subject that would do credit to a man while in other chapters the habits of insect, beast and bird are entertainingly set forth. She has even succeeded in making a most interesting chapter on "The Hog." When she touches upon the plants it is from an original point of view. "A clown among oaks is the black-jack, the genuine scrub oak. The trunk is so crooked woodsmen vow it takes it half an hour after it has been cut down to find out how it can lie still. It is knottier than it is crooked. * * As it grows, small branches develop all round, standing stiffly out at almost exact right angles. After a few years they die, but do not break off and have done with it. Instead they shed twigs, bark and sap-wood, yet persist as to the heart, standing out all along the trunk like bluntish iron pegs." The nature lover will certainly find this an agreeable change from the average book on such subjects. It is published by McClure, Phillips & Co., New York at $1.20 net.

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FOR THE PLANT LOVER

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THE AMERICAN BOTANIST

VOL. III. SEPTEMBER 15, 1902. NO. 3

SOME NATIVE PLANTS OF VALUE.

BY CHARLES TURNBULL.

"The clustering sumach flamed along a ledge,
The life of ruddy Autumn filled its veins
Deep growing masses glinting in the sun
Redder than the wild strawberry, where it stains
The woodland ways, mid light and shadow spun;
A gorgeous dream, a color-draught divine,
Spilled on the golden afternoon like wine."

In our autumnal perambulations we cannot fail to note the ruddy leaves and dark crimson spires of fruit in the spreading clumps of sumac (*Rhus*), strewn over the gray, boulder-covered hill. In that season when the bluejay screams in the wood and the nuts rattle down, it approaches the maple in the ruddiness of its foliage; but in the winter, no plant looks more desolate than it, standing forlorn and bare in the past season's dry and withered grass. It appears to be a gregarious member of the plant world and the colonies occupying long-abondoned fields or rocky hillsides, render considerable areas quite impenetrable. That solitary shrub is no doubt a hermit, or perhaps a pioneer that has thus boldly established himself and intends forming a new colony.

The commonest of the genus is the staghorn sumac (*R. typhina*) It is also the largest, often attaining the height of twenty feet, with extremely crooked, angular branches. The common name staghorn has reference to this very angularity. The tannin of the leaves imparts the tint of the brown hillsides to delicate leathers, but this principle is not so abundant as in the Italian sumac (*R. coriaria*). The wood is a splendid dark yellow having fine distinct markings and used sometimes in inlaid work. The species *copalina* or black sumac yields a kind of varnish.

After the trees are denuded of their scarlet splendor, and the woods are bleak and bare, we wander gravely through the groves or over the dusty roads, seeking almost vainly for some reminder of departed summer, a belated aster, a turtle head, or a frost-nipped gentian. The dark green Christmas fern (*Polystichum acrostichoides*), has a very certain beauty new, and how familiar the rough twisting rope of wild grape appears. In summer its foilage we never saw---only the brown shaggy vine--and its appearance is now unchanged. By the aid of a friendly chestnut, it rears its head so loftily and ripens its fruit with the fruit of the giants of the wood. It is to be regretted that sometime, no doubt through fear of a tumble to earth, it is induced to lay too firm and fast a grip on its host, often so tightly that it slowly strangles its friend, like a giant in the toils of a serpent.

The flowers are green and unconspicuous, but they amply compensate for their lack of beauty by their fullness of fragrance. A grape or a basswood may be perceived by its fragrance a considerable distance away, and there is probably no other wild vegetable odors so intoxicatingly fragrant and possessing their power of expansion.

A common wild grape is (*Vistis labrusca*), and one of the most valuable of the species indiginous to this continent. The dandies of the gardens and vineyards trace their ancestry to this honest backwoods stock. By reason of its hardiness and freedom from disease it is even replacing the European species, *Vinefera,* in the vineyards of the old world. The rich expressed juice, after a proper sojourn in the cellar is converted into good prime wine and the excellence of the crushed skins as a jelly or tart needs no commendation. Old fashioned cider-makers maintain that a bunch of the small frost grapes (*V. cordifolia*), dropped into a barrel of fresh sweet cider mellows its flavor and prevents hardening.

Along the thicket lined roads towards the latter part of the month of June, the breeze is laden with the fragrance of the elder (*Sambucus.*) A week later the ground is cloaked with the cast-off corollas, and by the last of August the full clusters of blue black fruit are proper for manufacture into the country housewife's aperient and diuretic elderberry wine. Wood of two years' growth is adaptable to the making of cobbler's pegs. The

pithy first year wood provides a weapon for young Nimrod, the elder-gun or pop gun. The old Romans constructed a musical instrument, the sambuca from its wood and this circumstance gives the genus the name of *Sambucus.*

Hartford, Conn.

AILANTHUS.

By Prof. William Whitman Bailey.

In describing this exotic tree, now so well established and so familiar, the late Dr. Asa Gray said: "It is called by Arabs the tree of Heaven, but is redolent of any other odors than those of Paradise." His remarks has reference to the atrocious smell of the staminate or male tree when in flower. The pistillate tree, for some reason less often seen, is on the contrary odorless. One knowing this, can freely grow the tree with all its advantages and none of its drawbacks. The good qualities consist in the extreme rapidity of growth, the comparative cleanliness and freedom from attack of insects and the picturesque and almost tropical beauty of the plant.

So vigorous is the tree, and so energetic in spreading itself, that the future New Zealander fresh from taking Kodak views of St. Paul's cathedral, and gazing meditatively upon what remains of our Wall street, would, it is surmised, find New York overgrown with ailanthus. So light are the seeds--or rather fruits, winged like those of the ash, that they fly about every where, and sprout on roofs, in gutters and at every point of vantage,

"Where they most breed and haunt, I have observed
The air is delicate."

Let a street or park be deserted and at once it is over-run with ailanthus. Indeed, the tree has been employed on the western plains to insure a rapid arboreous growth.

It has been spoken of as a clean tree, little attacked by insects, While that is true of some parts of the country, about New York in its wider sense, we find the ailanthus fed upon by a large, and to the nervous, a repellant looking caterpillar. This is the handsome larva of *Attacus Cynthia,* the well known silk worm of Japan and China and one of the most superb of moths, measuring sev-

eral inches across. This magnificent creature is painted with delicate shades and bands of olive green and lavender, and is a joy to behold. The caterpillar is equally beautiful after the observer rids himself of inherited dread and prejudice. These moths absolutely swarm in certain years in Greater New York. We have never seen them in Rhode Island, though the tree is not infrequent in our city streets, and is abundant about Narragansett Pier, Newport, and Seaconnet.

Its tropical beauty has been spoken of. This is due to a certain quaint and apple-tree-like pose of the trunks, and to the ample sumac-like pinnate foliage. These compound leaves are often two feet long. The fruit as it ripens, in most places, becomes yellowish and rather attractive. At Gloucester, Mass., and on Cape Anne generally, I have been surprised to see it of a magnificent red, as fine as that of the mountain ash. Salt air seems to affect color, as witness the superior brilliance of roses at Newport.

The plants kept low, and grown with spiraeas, clethra, and other flowering shrubs form an exquisite border. Its German name is Gotter-baum, "tree of the Gods," said to be a translation of it's Indian name, ailanto. The French call it *Vernis du Japon*. We occasionally observe trees thirty or forty feet in height. In Europe, where it has been grown longer, the tree is sometimes fully sixty feet high. The family Simarubaceae to which the ailanthus belongs, has with us no other representative, though the rue, the prickly ash and even the orange and lemon are not distant relations.

Brown University, Providence, R. I.

An American lover of flowers, on visiting England for the first time soon notices two interesting facts, namely, that many of our favorite garden plants grow there by the road, while inside the wall not a few of our common wildings are carefully cherished in cultivation. Thus in an English countryside purple foxglove, Johnny-jump-ups and scabious are plebeians of the fence rows and pastures, while goldenrod and five-leaved American ivy and rhododendron are aristocrats of the gardens.—*S.*

HABITS OF THE TWIN FLOWER.

By Elsie Murray.

"Beneath dim aisles, in odorous beds
The slight Linnaea hangs its twin-born heads."

quotes Mrs. Dana; and there is more about the "deep, cool, mossy woods of the North" that are its favored haunts. Ever since I first read those lines I have been looking for the *Linnaea* in the deepest, coolest, mossiest woods I know. I suppose it is the irony of Fate, that in all the twenty odd square miles thus explored, I should have found it by dusty roadsides only, in some dozen different places--and by the merest chance at that--with seldom even a remnant of woodland behind it, to form the background, fancy had pictured.

Once found, however, it may easily be forgiven the most prosaic surroundings. Surely the favor of the great Linnaeus was not misplaced in this charming little flower, with its tiny drooping bells, whose downy rose-pink lining and whose delicate helitrope odor one must nevertheless, bend low to notice and appreciate.

My acquaintance with the *Linnaea* in my own locality--a river county in Northern Pennsylvania, where it had long been proclaimed either extremely rare or extinct--runs back a few years only. Some years ago I discovered, in an old herbarium that I had collected on the nearby hills in my childhood, a single spray of what proved to be the highly prized *Linnaea*. From that hour vague recollections of shadowy woods where as children we tore up great mats of the tiny creeper to weave into fairy wreaths, have haunted me, and June after June I have searched diligently, to find it at last by pure accident some three or four years ago, along one of the roadsides before mentioned.

Such a brief acquaintance hardly affords a basis for the explanation of a fact in twin flower's life history that has recently come under my notice. During the second week of September, 1902, the *Linnaea*, in at least two spots several miles apart in my county, indulged itself in a second season of blooming. In so doing, did it obey a definitly fixed habit, or did it yield to an unusually favorable season, and double its annual output of flowers? About the same time, the *Cornus paniculata* and *Houstonia caerulea* also,

set rather anonalously, to flowering again. But the case of the *Linnaea* seems the more phenomenal, in that its flowering season in June is extremely short in comparison with the others mentioned. In a season which seems to have been unusually favorable to the wild flowers from the mountain laurel to the asters, it is possible that the *Linnaea* gathered strength to double its flowering period. Did it do so through any considerable range of territory? Or was the occurrence noted simply a customary incident in the annual activities of the *Linnaea,* that had hitherto escaped my attention?

WINTER BLOOMING FLOWERS.

By Ella F. Mosby.

They are not all winter flowers that I shall tell of, for the shepherd's purse, chickweed and henbit also bloom in spring and summer. The henbit is of the mint family and would be thought a lovely flower if it were only larger. Probably you often see it by a brook and do not notice it. The tiny blossoms are clustered in a graceful whorl around the stem and are all of violet hue except the lower lip, which is white with purple or violet spots, "fairy favors" as Puck might call them. The leaves have a fresh aromatic odor and are prettily and variously shaped, the middle ones heart-shaped with scalloped edges like many geraniums. One may often find these dainty blossoms on a winter day.

Another winter bloomer is the shepherd's purse, named from the odd three-cornered pouches of seed. It has a small white blossom. The little chickweed or starwort looks very fair when it covers the ground thickly with its small white stars in the most wintry season. No doubt it was one of these that John Burroughs speaks of as "a microscopic white flower" which he found blooming near Washington in midwinter.

Skunk cabbage and witch hazel belong to cold weather. The buds of the first are formed early and stand ready in winter for the first possible moment to unfold. They grow in swamps and their leaves show "like so many great emeralds above the black ooze." Bees welcome the blossoms, and get a good supply of sweetness from the pollen of the large flowers before even the arbutus makes the air delicious with hidden clusters. The leaves

of the witch hazel fall early, and its blossoms are seen on bare branches. "It is curious to notice this tough, angular, ugly skeleton of a shrub, studded with yellow-green flowers, whose petals are like ribbons and shine against the sun as golden stars." Thoreau says that while the tall hazels are bare of foliage, he found leaves on the low bushes as full of color as the blossoms, some clear lemon yellow inside the bush and a richer hue outside, while others were crimson, or green veined with gold.

The yellow disks of the dandelion may be found all the winter long in sheltered places, cuddled close and flat against the bosom of Mother Earth like a timid child. It does this to retain warmth as the winter honeysuckle covers its buds with close-fitting scales and the early hepatica swathes its nurslings in woolly or fuzzy wrappers.

Lynchburg, Va.

NOTE AND COMMENT.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

A FEW BEETS.--A pile of beets 15 feet deep, 120 feet wide and a quarter of a mile long was to be seen at a Colorado sugar factory recently. This beats the beet record for the season.

STAGHORN SUMAC.--The common name of *Rhus typhina* is usually supposed to have been given in reference to the soft velvety covering of the young branches like the budding horns of a deer. In this issue another origin for the name is suggested, which is equally appropriate.

IRREGULAR OCCURRENCES OF GENTIAN.--The beautiful fringed gentian (*crinita*) is very abundant in my locality; but blossoms are comparatively few on alternate years. Is it so elsewhere? *J. A. Bates So. Royalston, Mass.* [The plant seems to vary its behavior with the locality. We have yet to find out why it is not so common in some years as in others.--ED.]

A SEED DEFINED.--Most of us know a seed when we see it, but to give a definition that will exactly describe a seed is not easy. Here is one taken from the September *Botanical Gazette*. "A seed

is an ultimate, trigenerational, symbiotic unit in the plant life-history, integrated from tissues and structures belonging to two sporophytic generations and the intervening gametophytic phase."

Does Selaginella Bear Seeds?--The *Selaginellas* are among the higher cryptogams and so of course do not normally bear seeds. Certain megasporangia, however, have been observed to remain for a long time on the plants, and in this condition, their spores having germinated and the eggs having been fecundated, they assume the character of seeds according to Prof. Conway Mac Millan.

Variation in Plants.--Variations in shape, color and size of plants, flowers and fruits do certainly sometimes result from outside influences as fertilizing wild flowers with old tin cans will prove. Some limited observations have suggested the question if position on the plant does not cause some of this variation. Is the lower, first ripening fruit (e. g. tomato or pea) usually the largest and best or nearest to the type of the improved variety? --*J. A. Bates, So. Royalston, Mass.*

The Fruit of American Yew.--The fruit of the ground hemlock or American yew (*Taxus Canadensis*) is usually regarded as poisonous. This has kept most botanists from tasting it and the fact does not seem to be generally known that the scarlet pulp surrounding the seed is quite sweet. Although the belief in the poisonous properties of this plant is widespread, the makers of our botanies are silent on the subject. Can any of our readers tell whether it is really poisonous or not?

Large Forest Tree Nurseries.--According to *Forestry and Irrigation* the State of New York has established two nurseries for growing young forest trees which are of note from the number of plants they will contain. One in the Catskill region is planned for raising two million seedlings; the other in the Adirondacks will be capable of growing three million. The trees are to be used in the State's re-foresting work. Two parties are now in the forests attempting to gather enough seed of the species desired to fill the nurseries.

Unusual Plant Names.--Referring to the puzzling plant names in the August number, Rev. James A. Bates of South Roy-

alston, Mass., writes as follows regarding the term,"crackers" applied to the huckleberry. "We call the black huckleberry (*Gaylussaccia resinosa*) 'black snaps.' Eat them and the seeds snap. They are now (Sept. 26) just passing their prime with us--the last of our edible berries except the cranberry and wintergreen." Without doubt "crackers" refers to these same snapping seeds. As to universe vine applied to the bearberry (*Arctostaphyllos uva-ursa*) it is probably another popular attempt at making English out of the specific name.

Nomenclature and Taxes.--There is in France a positive prohibition of the general cultivation of tobacco plants, the growing and selling of tobacco being a Government monopoly. This prohibition applies to gardens and greenhouses, and no ornamental uses may be made of the *Nicotianas,* notwithstanding that all are not used for the manufacture of "the weed." A curious result of botanical revision complicates matters. *Nicotiana colossea* of Andre is thus excluded from gardens, although not used in manufacture. It was formerly known as *Lehmannia colossea,* Sprengel. The question may be asked, could the plant be grown if the old time nomenclature had been maintained? The grouping together of closely allied genera is responsible.—*Indian Gardening.*

Which is the Lightest Wood?--Cannot someone settle the question as to which is the lightest wood? *Leitneria floridana* stands .207 and *Ochroma lagopus* has been reported both as .25 and as .12. And is *Condela ferria* surely the heaviest--at 1.302? *O. W. Barrett, Mayaguez, Porto Rico.* [The Florida lightwood (*Leitneria Floridana*) has thus far been regarded as the lightest known wood. The wood of the roots is said to have a specific gravity of .151. Since it can not readily be imagined just how light this is, it may be added that common cork has a specific gravity of .24, the willows and poplars range from .37 to .60, the white cedar stands at .332, the white oak at. 747 and some of the hickories at .83-- the latter four times as heavy as lightwood.--Ed.]

Inaccurate Botany.--If one would have proof of how much the botanical manuals and even our popular books are made in the herbarium instead of the field, let him compare their statements about plants with the plants themselves. Take the berry

of the false Solomon's-seal (*Smilacina racemosa*) for instance. All the books from Britton to Dana, including Gray, Wood, Lounsberry and no one knows how many more, speak of the berry as being pale red speckled with purple. F. Schuyler Mathews seems to be the only one who has really described the berry as it is. He says "The berries, smaller than peas, are at first greenish, then yellowish white, speckled with madder brown and finally in late September, a dull ruby-red of translucent character." This is exactly the case. When the berries are really ripe they are unspotted. Those who have described them as speckled have seen only unripe fruit!

A Poisonous Horsetail.--The Vermont Agricultural Experiment Station has published as Bulletin No. 95 (June, 1902) an interesting report by F. A. Rich and L. R. Jones, on the reputed poisonous properties of the common meadow horsetail (*Equisetum arvense*), often known among Vermont farmers as foxtail. Facts personally gathered during several years and the results of experiments conducted at the State Station at Burlington lead the authors to aver that this common plant when dried, as in hay, is dangerously poisonous to horses, causing death if its use is persisted in. An odd fact, which the report mentions, is that horses will develop a depraved appetite for the equisetum and eat it in preference to good timothy or even grain. There is no evidence that the green plant eaten in pasture affects them injuriously. Cows eat the horsetail hay with apparent impunity, but the testimony with regard to sheep is contradictory.

The "Ornithologist and Botanist."--Ten years ago, there was published in Binghamton, a monthly journal devoted to birds and flowers called the *Ornithologist and Botanist*. The combined ages of editor and publisher were less than forty years, and one year of that particular brand of "the strenuous life" was enough to satisfy. There still remain several sets of this volume complete except the first three numbers, and the contents are still of interest. The publication was the first "official organ" of the Gray Memorial Botanical Chapter. On this account it is possible some of our readers would like a set since most of the chapter members are on our subscription lists. We therefore offer to send a set of the journal (72 pages) to anyone who will send us

ten cents in stamps to pay for postage and the time required in going up into the attic where they are stored after them. Address THE AMERICAN BOTANIST.

MULBERRIES AND THIMBLEBERRIES.--My mother, who was a New England woman, states that in New Hampshire and Massachusetts, when she was a child, the red raspberries were called mulberries, and the blackberries thimbleberries. Also the common hickory nut was there called walnut and the butternut was called oilnut, on account of its oily nature.--*Elma Iona Locke, Berlin, Wis.*

ASPLENIUM EBENOIDES A HYBRID.--It has often been suggested that this fern is a hybrid between the walking fern (*Camptosorus rhizophyllus*) and the ebony spleenwort (*Asplenium ebeneum*), but proof has always been lacking. This is not the case, at present, for Miss Margaret Slosson has recently successfully crossed these two species, producing forms similar to the form in question. One of the remarkable things connected with the experiment, is that the species crossed belong to different genera. It is also interesting to note that the very species suggested as the probable parents, prove to be the right ones.

THE OPENING OF A MOONFLOWER.--It is seldom one can "see a plant grow," but it is sometimes possible to perceive the movement of an opening blossom. Last evening we watched the moonflowers open. At half past five there were several buds ready to open. At a quarter to seven they had changed butl ittle, but before seven o'clock two or three had opened to nearly or quite full. One opened slowly, but one could see a steady movement as the flower expanded; others were helped by the wind blowing into them, so their movements were quicker and less continuous. It was a very interesting sight.--*Elma Iona Locke, Berlin, Wis.*

LAST ROSE OF SUMMER.--Mr. James A. Graves, Susquehanna, Pa., notes that in portions of Northern Pennsylvania the New England aster (*Aster Nova-Angliae*) is much cultivated in dooryards and goes by the name of "the last rose of summer." In the same region the usual name of aster is seldom applied to this plant, probably being reserved for the exotics of the flower garden. Although single blossoms of cultivated asters outrival

those of this hardy native, there are few plants of late summer that can be compared with a clump of it in full bloom. It is a desirable addition to any flower garden.

More Extinct Species.--Those not personally interested in the combat, must derive no little amusement from the species tinkering so much in evidence at present. The species makers are not having it all their own way, as at first, but as soon as one botanist has set up a long line of new species another of the same craft rises up and knocks them over. The latest to go are some twenty species of the genus *Nemophila* to which the well-known "baby-blue-eyes" belongs. H. P. Chandler says in the September *Botanical Gazette*: "An almost infinite variation makes an accurate limitation of species absolutely impossible. Were these all described they would fill a volume, but nothing would be gained thereby. Convenience should be the aim of classification and this aim is most effectually defeated by the multiplication of uncertain species." The opinions held upon this subject by Mr. Chandler seem to be gaining ground among thoughtful botanists and a large number of our most cherished new species appear to be on the verge of extinction in consequence.

How the Indian Pipe Lives.--An interesting feature in its life history is the comparatively modern discovery that it is not, as formerly supposed, a saprophyte, living on humus deposited by decaying leaves; but is, after all a root parasite, with a fungus for the host plant. For this the term symbiosis has been constructed--literally, plants living together. But they do more than this. It is supposed they are essential to each other's existence. This may be correct so far as the *Monotropa* is concerned. We find the dense ball of roots closely interwoven with the mycelium of a fungus--but evidently the same fungus is abundant in the rotting leaves around without any Indian pipe growing with them, and owing nothing to the "pipe" as symbiosis would imply. There is yet much to be learned about the behavior of these plants: *Sarcodes sanguinea, Hypopitys* and *Monotropa* all seem to have their "elaborated food" from the same fungus and are yet all essentially different in color, and may therefore be reasonably charged with some hand in the elaboration--*Meehan's Monthly*

THE OPENING OF FLOWERS.--There still seems to be much to learn about the conditions which govern the opening and closing of certain flowers. The four o'clocks of our gardens are so named because they open very close to the hour of four in the afternoon, but late in summer, their ideas of time become sadly confused. They then are late in opening and do not close much before noon the following day. The morning glories, too, which early in the season close by mid-day, in September would justify the name of all day glories often remaining open until dusk. Scientists are fond of telling us that the opening of the flowers, and their odors and colors are all adjusted to the wants of various insects, but it is probable that certain amounts of light and heat are fully as potent factors in developing fragrance, nectar and color. The behavior of the four-o'clocks and morning glories would seem to indicate that their opening and closing is not altogether with reference to insects. And what shall be said of the Goat's-beard (*Tragopogon pratensis*) which as soon as noon comes, promptly shuts up shop for the day regardless of the fact that its insect customers are then abroad in the greatest numbers.

ODOR OF CATALPA LEAVES.--I have examined several catalpa trees since reading Mr. C. F. Saunders' note in the July issue of the BOTANIST, and in each instance found the terminal leaves of the branches "strongly scented." No odor was perceptible from the older leaves, neither did crushing them in my hand develop any. From which I conclude that only the new leaves at the ends of the branches are *strongly scented.* It is singular that this characteristic of the leaves should have been seemingly overlooked by our botanists, or, perhaps if known, was not thought worth the mention. The specimens I looked at, were doubtless *Catalpa bignonioides,* as that species is the one generally found growing on our Northern lawns. It is the species mentioned in "Illustrated Flora" and Britton's new Manual as having stronger scented leaves than *C. speciosa,* the other member of the family. Possibly the two species may be distinguished by the odor emitted from the terminal leaves. Some of the trees gave off a stronger odor than others. Catalpa leaves also afford a striking example of shrinkage in drying, the loss in size being about 45 per cent or nearly half. Consequently, if anything like accurate measure-

ments were wanted, herbarium specimens would fall much short of the actual size when green.--*James A. Graves, Susquehanna, Pa.*

Common Names for Plants.—Every nurseryman and florist knows that much of a plant's popularity depends upon its possessing a good common name. A lady recently wrote to our esteemed contemporary, *The Florists' Exchange,* about a plant of *Aralia spinosa* which they figured and gave its common name as well as its botanical appellation. Certainly the common name of "Devil's Walking Stick" is not a nice name, especially for a plant belonging to a lady. This sensitive dame wrote to the editor complaining that she liked the plant but would not think of owning anything with a name like that. He was not cornered, for, in replying, he referred to the plant as the Angelica tree—a name used by old gardeners. No doubt by this time the little prejudice against the name has been removed, and she is now the proud possessor of an *Aralia spinosa,* alias Devil's Walking Stick, alias Angelica tree. This is as good as the lady who was most profuse in her remarks of admiration for a tree of *Cercis Siliquastrum,* which she saw in full bloom and immediately ordered one, but on learning that its common name was The Judas Tree she cancelled her order, saying that it was no fit tree for a vicarage garden.—*Gardening World.*

Cross-Pollenation in the Monkey Flower.—In connection with the subject of cross-fertilization, a singular behavior of our plant (*Mimulus ringens*) has been referred to this supposed arrangement. The stigma is formed of two thin plates which are irritable like the leaves of the sensitive plant. About the time when the pistil is ready to receive the pollen, these plates expand. When touched by any foreign substance, the plates slowly close. Usually in plants of this order the anthers mature their pollen before the pistil has finished its growth. Pushing through with the plates closed, it is assumed that it prevents the deposition of its own pollen on the inner receptive surfaces. An insect visits the flower while the plates are expanded, depositing the foreign pollen, and the plates then close, giving the introduced pollen a chance to develop its tubes. This is the hypothesis. There seems, however, to be no record of any actual experiments or close observation on this point,—and there is yet a good oppor-

tunity for the student of plant-life to discover new laws. The peculiar behaviors of plants are often of service to the student in matters of classification. Some botanists place the order of Trumpet-flowers, *Bignoniaceae,* very close to the order of *Scrophulariaceae,* in which *Mimulus* is placed. Some species of the former family have thin, irritable plates for the stigma just as *Mimulus* has, indicating that the close relationship botanists have supposed is correct.—*Meehans' Monthly.*

Stonecrops as Lightning Conductors.--The name of this family (*Sedum*) is suggestive, for the plants sit patiently on during the extremes of heat and cold. Bentley enumerates thirteen British species. The most frequent are *S. tectorum* and *S. acre,* possessed of very opposite qualities. The former plant enjoys a curative reputation amongst old wives and herbalists. Since the introduction of slates the sight of a red-tiled cottage covered with this *Sedum* has become rare--at least in the neighborhood of populous towns. Sixty years since it added very much to the picturesque beauty of many a roof in the Lake District. When pedestrianizing in company with a brother pharmacist we admired a fine display on the roof and outbuildings of a farmhouse. The tenant, an aged, but hale and hearty lady of primitive manners, volunteered the information that a building was thereby protected from thunderstorms, and that "this very house was saved by its intervention. In my grandfather's time the lightning struck the roof and turned the thunder-flower all to a jelly; but the house was saved, and that is why it is called thunder-flower." Some twenty years after, when traveling on the continent, this *Sedum* was noticed growing abundantly upon many a housetop in Belgium, where it was known as "Dunderblomen;" at Arras, in France, it was styled "Fleur de Tonnerre" It is remarkable that this humble plant should be thus recognized in places so remote from each other, and it might be of interest to lovers of plant-lore to investigate the subject, and if possible extract the extent and origin of the legend, which may date from remote antiquity.--*Pharmaceutical Journal.*

The Ripening of Mitchella Repens.--The note in the July issue referring to the ripening of *Gaulthera procumbens* and *Mitchella repens* fruit under the snow somewhat surprised me,

and while not sufficiently familiar with the fruit of the former to venture an opinion, recollection, and personal observation of the latter since the note was read, do not confirm the statement.

The berries persist through the winter and spring, but I recall that shortly before the flowering season, in July, they were few and badly shriveled. Early in September I went over the old grounds to ascertain if possible the time of ripening. Some of the berries were green and only half-grown; others were partially reddened, proving that not all wait for the snows to fall; in a few places large, bright scarlet berries gleamed forth in profusion. Of course I am not able to say positively that these are not old berries rejuvenated by the copious rains of the past summer. Yet if memory serves aright they are now in greater abundance than in June. Numerous specimens partly reddened and some almost completely colored prove that not even frost is necessary for their maturity, consequently I still cling to my original supposition that *Mitchella* ripens its fruit in autumn; that unless picked it is persistent until shortly before the blooming season of the next year. Though berries and flowers are not uncommonly found together, the shriveled appearance of the former at this time seems rather against the theory that any considerable proportion of the berries survive a second year.--*Bessie L. Putnam Conneant Lake, Pa.* [Observations of this kind are of much interest. It is probable we shall soon be able to settle this berry question.--Ed.]

The Ground-Nut in Cultivation.--Two years ago I took up two tubers of the ground-nut (*Apios tuberosa*) from the stony shore of Lake Champlain where there seemed to be no earth for food and where they were under water at the time of the spring floods. I placed them in ground that is under cultivation, and that is enriched each year by a top dressing in the fall. Last year I had two fine plants. The stems which must have been five or six feet long, clambered up over some brush put in for their support. The leaves were large and very dark rich green in color, while the blossom clusters, one for almost every leaf axil, were all that could be asked for. One would have been obliged to hunt a long time to find any plants that equaled these. This year I have thirteen plants instead of two. One of the old plants

failed to come up but the other is doing better than last year. The other plants are grouped around within a radius of eighteen inches. Some of the stems must be fully eight feet long and they make a very pretty show as they clamber over a large scraggy branch. The foliage shows no signs of deterioration while the flower clusters are considerably larger than those of the preceding season. From this experience of the past two years, I am inclined to think that plants will not only grow, but will improve under cultivation. If they multiply as fast next year the trouble will be to keep them from growing rather than to get them to grow.--*Eunice D. Smith, Barre, Vt.* [If our correspondent has not yet observed it, she will be interested in the plant's methods of securing cross-pollenation--one of the most ingenious methods to be found among our common plants. It is also to be noted that notwithstanding this machinery for cross-pollenation, ground-nut seeds are among the rarities. The reason for this is supposed to be that the plant being able to spread so rapidly underground finds little use for seed.--ED.]

EDITORIAL.

Some days ago, the editor came across a most curious collection consisting of nearly thirteen thousand buttons no two of which are alike. In getting this immense number of different forms together, the owner has spared neither time nor money and the unique result is something with which the button strings of childhood days, are not to be compared. The very immensity of the task of sorting out and arranging all those buttons gives the collection a touch both of importance and value and the owner is justly proud of the fact. But as string followed string in seemingly endless procession, one could not help reflecting upon the vast amount of energy that had here gone to waste. Years of work and correspondence and the dollars that make these possible all summed up in a great pile of buttons! A similar devotion to any branch of natural science would have made the student an authority; a like enthusiasm for scientific collecting would have formed a collection that even the authorities would have been glad to consult. But before we condemn the button-collector it would be well, perhaps, to see if we have not as useless a collection of our own. What of the plant lover who is constantly seeing new or interesting traits in his favorites, but neglects to make them known to others? Is his knowledge anything more to the rest of us than a string of buttons? And the man who is so eager to collect new material that he never has time to properly arrange what has already been collected--of what greater value to his generation is such material? And the one who disputes over obscure points in nomenclature, and the mere gatherer of botanical facts--but why continue when the moral of the sermon is in full view? If we would turn our leisure to good account, we must not only take up something of permanent interest, but must make the results of our labors known to others. And in this direction there is nothing at once so attractive and so full of promise as the study of botany.

Now is the time to select your wild shrubs and trees for the lawn and garden. It is much better to transplant such things in autumn than at any other season. Growth has ceased and if they are moved now and properly planted, they will be ready in spring

to throw out new roots and leaves with scarcely a perceptible halt. It is an excellent thing to have specimens of our wild shrubs near at hand for study at all seasons. If for lack of space or other reasons you cannot have representatives of every desirable species you will make no mistake in selecting such things as are conspicuous in both flower and fruit. The wild crab-apple may be planted quite as much for its fragrant, greasy apples as for its delightful blossoms. The wild plum, the beach plum, the June-berry, the frost grape, and the elder have each two seasons when they command out attention; in one pleasant to the eye, in the other agreeable to the palate. Still others with inedible fruits are desirable because of the bright display this fruit makes in the dull days of late autumn and winter. Among them may be named the flowering dogwood, the barberry, the hawthorn, the chokeberry, the sumac, the viburnum and the fly honeysuckle. Most of these may be purchased of the nursery men, but the editor likes to shoulder pick and shovel and get his specimens at first hand. Digging about their roots and finding out how they are anchored to the soil, is found to be an excellent way of beginning their acquaintance, and moreover it forms a substantial foundation upon which to build a subsequent knowledge of the plant's life.

The Plant World, having begun publication in 1897, announces that the September number will be its "wooden wedding" and that it will publish a portrait and biography of its senior editor as appropriate to the occasion! Such discrimination, however, appears quite unnecessary, in view of the kind of anniversary celebrated.

Herbarium making is a serious business. It calls for the expenditure of large amounts of time and a fairly large amount of money. It is therefore well for the young botanizer to consider the subject carefully before wasting his precious time in mummifying plants to be stowed away in dusty pigeon-holes. I do not mean to disparage in any way the accumulation of plants by museums, universities and botanical gardens for these collections are invaluable to the student, but I would point out, that so long as we have these vast collections of plants easily accessible, it is

a downright waste of time for the ordinary botanist to make a general herbarium. The collection mania is one of the first indications of a scientific bent and must be indulged; but it is well to confine the collection within certain sensible bounds. If you are making a "dead set" at the flora of your region, make an herbarium specimen of every species, sub-species and form encountered and to these add related species from adjacent districts by exchange. If you are interested in certain families of plants, collect not only every species and form, belonging to that family, but the fruit and roots and seed, also. Make other specimens to show each species in all important stages from seedling to maturity and get by exchange the same species from as many distant points as possible. If interested more in the esthetical side of botany, a small herbarium consisting principally of the showy or curious flowers, fruits and leaves of your locality will be excellent. The great collections are still none too rich in rare plants and their curators will be glad of such specimens as you may find; but it is worse than useless to go on collecting all sorts of common plants and adding other common plants by exchange for the sake of having a large herbarium. Better, far, a small herbarium well studied, than a large one upon which the dust continues to collect.

C. H. Bissell and Luman Andrews have recently issued a very creditable "Flora of the Town of Southington, Conn., and its Vicinity," which is published by the State Board of Education. The area covered is about 36 square miles and the authors find 1,200 different species growing without cultivation, a very large number in comparison with similar areas elsewhere.

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HOW THE TURKEY MULLEIN LIVES.

By M. F. BRADSHAW.

In this "land of sunshine" and winter rains, where the earth grows yellow and brown from May to November, one would hardly look for fall flowers. Indeed a superficial glance over the hillsides and plains would cause most people to say there were none and that the earth was bare.

But I think a close inspection of these bare places would constrain them to acknowledge there were many plants--some even pretty. A student finds more than this, for these dry-weather plants are among the clever ones of the earth.

Clever they are, because they have chosen a time when there is little competition for room and sunshine; they can spread themselves out in exactly the shape they like best, with no tall neighbor to overtop and shade them. Clever in their methods of self-protection and reproduction, and successful in life as well, for there never was a drought that discouraged them.

Let us look at one *Ereomocarpus setigera,* called "turkey mullen," "turkey weed," "poverty weed," "tar weed" and I don't know how many other local names. It is one of the euphorbia family, and quite the most numerous, though its relations are by no means few here.

It grows prostrate, fastened to the dry earth by a slender root and looks almost as if it could do quite as well without any so inadequate does the root appear. I say prostrate, though in favorable situations, such as cultivated land it looks up and attains a foot or more in height. However, in the hard, sun-baked earth of the plains or slopes of the lower hills, it seems to be most at home and here it lies quite flat. Its color is gray-green, the small clusters of flowers surrounded by leaves of the same color, and only noticable by the protruding white anthers. The whole plant is really graceful and so thriving and healthy and perfect in every

part that it is certain to be admired when one sees it--which most people do not.

Pick a branch and you have doubts after all whether it is to be admired, for it is closely covered with harsh hairs that are anything but pleasant to touch. It is also sticky and the smell is decidedly objectionable. Be assured; it does not sting or poison, and well repays close acquaintance. These hairs, placed under an ordinary pocket lens are most wonderfully arranged; set in bundles like cluster of many needles with a hat pin in the center. The hairs seen with the naked eye are the long ones only.

These hairs are thickly interlaced and serve several very useful purposes, the first of which may be protection from sheep or other grazing animals, for in this dry, bare season food is scarce and everything available is cropped. Then they protect the epidermis from dust which otherwise in this country would quickly choke the pores; and they supply the plant with water. Look at a turkey weed any dewy or foggy morning and see how thickly the drops of water are set on these hairs; pick a branch and see how heavy. By experiment the leaves have been found to double their own weight and with a microscope the water can be seen to enter the hairs; that is why the plant grows and blooms and matures seed, with no rain, soil dry and hard and a continuous blaze of hot sunshine.

The unpleasant, acrid smell probably is another device for keeping away grazing animals for it is said that sheep when starving will not eat the plant. In the latter part of July or August it makes its appearance and by the end of October it has lived its life.

Orange Cal.

EXPERIMENTS WITH THE FRINGED GENTIAN.

By Chas. C. Plitt.

In the Note and Comment department of the September Botanist, Mr. J. A. Bates notes the irregular occurrence of *Gentiana crinita* and "that the blossoms are comparatively few on alternate years." I have noted the same irregularity here in the vicinity of Baltimore, and offer the following, which tends to show that the plant is a *biennial* and not an *annual* as stated in Gray and also in Britton and Brown, as the explanation.

When I first noted this irregularity, I thought it was mainly due to the terrible onslaughts the plant receives when in bloom, for I had noted several times that every plant in sight had been gathered, but a florist friend thought it was because the plant was a biennial.

As no plant can stand such treatment and not be exterminated, I decided to transplant a few to some secret place.

This was done three years ago. My transplanting was a success and the plants ripened their capsules and disseminated their seed. The next year, (two years ago), I visited the spot, hoping to find plants that had grown from the disseminated seed, but I did not find a single one. Thinking that my transplating had been a failure, I decided to try again, this time with about a dozen plants. The plants were planted on the same hillside, but in three sections, one above the other, and about twenty feet apart.

Unfortunately my first section was planted close to the spot where the plants of the preceding year had stood. This I recognized the next year when I visited my "Gentian Place," for far down the hillside, where I had transplanted the plants two years ago, stood as beautiful a plant as one would care to see, with sixteen fine blossoms. It was not discovered by any one and ripened its seeds. I examined the spots where the other sections had been planted, but no other plants were found. I was now in a quandary for I could not tell if my plant had grown from a seed disseminated last year or from one disseminated two years ago. You may be sure that I anxiously awaited results this year.

Early in August I was on the look-out for plants, and the discovery of seventeen pretty little plants at the foot of the hill, was hailed with delight. In the middle of September the plants were in bud and two weeks later in flower.

Again, the hillside is examined for I now thought of the spots where I had transplanted the plants two years ago. In a few minutes, I, full of expectation, reached the first spot. What a pleasant treat was there awaiting me--eighteen fine plants in full bloom! I stopped only long enough to count the plants, and then hastened to the other spot higher up the hill and here again were the Gentians--ten more fine plants.

I think my experiments show almost to a certainty that the

plant is biennial, at any rate in this latitude. To make doubly sure, however, I am trying my experiments all over again, this time in two different localities. I might, here also mention Mr. J. Ford Semper's experiment. Mr. Semper's home is Aikin, Md. Two years ago he planted seed of *G. crinita.* A number of the seeds germinated, but of the lot only one plant reached maturity, blooming this year.

Baltimore, Md.

CAMP FOLLOWERS OF THE FOREST FIRE.

By Elsie Murray.

There are certain fire-swept mountain stretches, solemn, lonesome in the early twilight, when the scant moonbeams struggle raggedly over their desolation that seem far-reaching barrens, pathetic, but for the grandeur of the towering grey skeletons, stripped of leaf and bark and silent save for the passionate, despairing cry of the whip-poor-will.

But revisit the scene in the gay whirl of a summer's morning and presto! change! You'll find the *genius loci* has dropped her tragic mask and the very spirit of comedy is tripping it over the slopes. The tremulous aspen and her adopted sister, the aspen-foliaged birch are rioting in the morning breeze. The torch of the great fire weed is lighting up the waste far and wide, and the steeple bush and the tall Joe-Pye are echoing its tints of rose and lavender.

Most feminine of trees is *Betula populifolia;* straight white-limbed, supple, with pliant spray and light green foliage, fluttering, rippling as with laughter in the lightest breeze, and ready to go into hysterics, as it were, if the wind persists in teazing her. Obedient also to lower her head before the swift summer storm-wind, till every leaf and branch drifts in the track of the gale. How every graceful, yielding motion refutes the myriad-pointed menace of her foliage--every leaf of which--as the late William Hamilton Gibson once pointed out--is cut in the pattern of the deadly Indian arrowhead. At a distance, the black markings on the chalky bark,--the black creases where the trunk springs from the soil, the black triangles wherever a limb springs from the trunk,--at a distance these smutches tone in with the virgin white

and on the whole the tree does not belie the nickname of grey birch. Often, however, the young branches, even the *trunks* of the saplings, are a glossy rich dark red-brown and require many moultings before they attain to the white toga of maturity.

Short lived, small statured, a lover of the open--this most gregarious of birches shuns the strange thick-foliaged giants of the deep wood and wins itself a foothold on deserted barrens and fire-swept wastes, in little companies of six and eight. Here for at least a generation she will have few rivals. Only the young fire-cherries, with their slender trunks of burnished bronze, and their blood-red clusters of fruit, dangling to tempt the birds to an involuntary extension of their sway, or the tremulous aspen--slimmest and smallest of the poplars and its kinsman, the sturdier large-toothed aspen.

What pen or brush could portray the delicate fantasies of coloring one often finds on the smooth straight shafts of these two cousin poplars--*tremuloides* and *grandidentata?* In a single thicket you may meet a half dozen different grey-green tones in as many saplings; while in a morning's walk, the gamut runs from a soft old gold to a dull or silvery pale grey bark, that at a little distance closely imitates the white (or grey) birch. It wears however, always this hall-mark of distinction-- a great dark eye with delicately penciled brow, in place of the black *triangular* dead limb scar of the birch.

So both poplars appear under a dozen different bark-disguises --now yellow, now green, often slightly clouded, as though overhung with the thinnest of pale grey gossamer veils-- under apparently only the slightest variations in age and situation. One does note, however, that the greens and yellow are more prominent in the younger trees, or in the older ones, after a heavy shower; while the bark of full grown poplars is often furrowed and darkened at the base quite out of resemblance to the younger smooth-skinned members of the family.

The small, chubby outlined leaf-blade of *Populus tremuloides* and the larger one of *Populus grandidentata*, with its bold-toothed margin, are both alike provided with a long flattened petiole set like a tiny sail for the breeze and ready to turn the whole tree into a thousand whirling green windmills. The same breeze

that starts the windmills, sets adrift in May the long haired seeds of the tremulous aspen. On they float, till piloted by chance, they reach the fire-blackened wastes where even the buried seeds and nuts have perished in the heat. Here they drop their worn silken wings and root, and along with them the seed of the great fire-weed, borne hither by the wind in its silvery curls. A host of other wood things, great and small, follow these pioneers. The white birches gather gratefully on these wide moors, fire-swept of rivals, and as the years pass, the green wave of vegetation again sweeps over the mountain sides.

Sans Souci, S. Cor.

GATHERING NUTS.

By Prof. Wm. Whitman Bailey.

To the New Englander there is probably no pleasanter recollection than that of gathering nuts in boyhood. The very thought of those early days attunes the mind to peace and quiet. How well we recall how we used to harness up the old horse, take out all but one seat of the wagon, pack up a hearty luncheon, and set forth for the woods.

These nutting days are also gentian days--suffused with a golden mist; days when the leaves simply drop by their own weight. We observed whole showers of them, yesterday, fluttering through the air like butterflies. One does not need to consult the calender to know when nuts are ripe. An instinct, a something in the air tells him.

Although the horse-chestnut is not one of the edible kinds, it deserves mention for its intrinsic beauty. It is always a delight to see the great green, prickly pods burst open to reveal their mahogany treasures. Where is the joiner or cabinet-maker who can attain or even faintly imitate these beautifully polished and daintily veined globes?. After a half century of experience it still remains a mystery to the writer to know what the small boy does with the immense quantities he amasses. Vainly have we sought information of the youth himself. He stammers and becomes confused when interrogated. The fact remains that no horse chestnut tree is safe from boyish assault and battery.

Of the edible nuts, we suppose that, for a variety of excel-

lencies, the true chestnut is the favorite. The trees are beautiful at all seasons and now are clothed in gold or amber. Children are apt to force the season and gather the nuts too young. The time to seek them in October is after a cool breezy night. Then the spiny burrs open on the trees and the brown beauties come showering down. What a pleasant patter they make! What a delight and fascination there is in poking with a stick among the leaves and finding their retreats! It almost seems as if they were endowed with consciousness and wittingly secluded themselves.

Speaking of the burr, what a consummate work of art it is! Without it is defended by an intricacy of sharp, irritating spines *Notli me tangere* is its watch-word. Within, each of the valves or divisions of the pod is velvet lined as for the reception of some precious gem. The polished surface of the contained nuts must not be marred. There they nestle, three of them usually, close-fitting, with the middle one compressed. Each is tipped with a long spur-like style, for these are more than seeds; they are fruits.

As an instance of contented fatness-- one that would please the elder Squeers-- commend us to the chestnut worm. There he dwells in Nirvana merely eating and sleeping, too obese even to crawl. He is really a most amusing little fellow, a "greasy citizen," indolent and happy; we feel ashamed to disturb his rest.

To us, the black walnut would come next in order of merit to the chestnut, but it is hardly common enough about here to be much reckoned with. Its cousin the butternut, really a true walnut, is much more frequent in New England and extends far north.

The shell-bark hickory is one of the best nuts, and fortunately very abundant. It's flavor is very rich and delicate; it's parent tree among the finest in our forests. Tough, lithe and supple in youth it grows to grand proportions and symmetry. We are apt to find the trees in groves on rocky hillsides. These trees and their near relatives are not, as they are always called in New England, walnuts, but hickories. The noble pecan of the South, best of all American nuts is a member of the same genus *Hickoria* or *Carya* So are the several kinds of pignuts.

The beech nuts, very common with us, the fruit of one of our most superb and shapely trees, is not sought for much as food.

we have so many other nuts that are better. The same is true of our hazels or filberts, but these are attractive from the fantastic beauty of their frilled caskets. We have two kinds, one of which has the involucre prolonged into a beak.

Two accounts of nutting days always come back to our memory. The one is in Miss Warner's "Queechy" and the other in Beecher's "Star-papers." Both are imbued with the true wood spirit.

Providence, R. I.

PASTURE FRIENDS.

By Charles D. Trumbull.

Most of us have ineradicably imprinted on our minds, a book of memory pictures, gathered from numerous trampings in the fields and hills. Some are simple sketches, the sinuous, meandering brook, forcing itself around an obstructing hill; some grand, spreading panaromas; others inimitable patches of color, the May meadow, with buttercups yellow or a splash of flaming meadow-beauty in August. On rainy days we turn the leaves of this book and dream over the gray boulders on the hills, or the cedar trees that stands so prominently forth in winter from their sad colored surroundings. On this particular day our gaze lingers on the poor close-cropped pastures, furrowed and broken where the ancient cornfield once flourished, but now the encampment of an army of hardhack (*Spiraea*). We review each individual friend, from the gnarly twiggy wild apple to this same omnipresent friend hardhack.

No pasture is without this vagabond flower, every pasture, rich or poor, must entertain some of those graceful spires of pink. Around the swampy hollow they muster in a dense compact line, and aided by the scraggly button-bush (*Cephalanthus occidentalis*), they conceal the spot and shield the browsing cattle from the quaggy slough. With compassion for the snow-birds, they retain their bunches of seed and from the snow bound pastures they thrust forth a goodly meal. In mid-summer the weather colored relic of other summer days sway in the breeze like a forsaken last year's bird's nest.

All who have ever read Henry Thoreau's account of the per-

sistent growth and indefatigable development of our gnarly wild apple must experience a feeling of affection for this meek Yankee tree. Thus he describes his search for the "Last Gleaning" of wild fruit. "For I know that they lie concealed, fallen into hollows long since, and covered up by the leaves of the tree itself,--a proper kind of packing. From these lurking places, anywhere within the circumference of the tree, I draw forth the fruit, all wet and glossy, maybe nibbled by rabbits and hollowed out by crickets, and perhaps with a leaf or two cemeted to it, but still with a rich bloom on it, and at last as ripe and well kept, if not better than those in barrels, more crisp and lively than they. If these resources fail to yield anything, I have learned to look between the bases of the suckers which spring thickly from some horizontal limb, for now and then one lodges there, or in the midst of an alder-clump, where they are covered by leaves, safe from cows which may have smelled them out." In his quaint fashion he named our friend of the pasture, *Malus campestrivallis,* "the Apple which grows in Hollows in Pastures." The Truant's apple, (*Cessatoris*) and the Saunterer's apple we easily identify, and *Pedestrium Solatium*, is the friend of our autmun trampings.

On the rain-washed claybank, we usually meet the white hoary mullin (*Verbascum*). Its finely colored blossoms would make a very handsome spike were they all to bloom simultaneously. Rubbed on the cheek, the woolly leaves impart as fine a com--plexion as ever graced a Devonshire maid. The dry naked pole still holds itself aloft until the last heavy snows of winter weight it to earth.

Near where the home-returning herd have worn a rough path, the regal thistle has established itself so sturdily and staunch. In blooming time the brown bees struggle among the purple blossoms, endeavoring to wrest their store of nectar from the kingly grasp. The common *Cnicus lanceolatus,* is named by some botanists as the representative of the Scotch thistle in America, but any of us who have enjoyed an opportunity of seeeing the growing Scotch thistle, are impressed with the beautiful downy appearance of both stem and leaves, much more abundant than in the *Cnicus lanceolatus.* It is a much controverted question respecting the genus in which it rightfully belongs. The ancient

coins and paintings reproducing its form were not intended to be botanically exact, and therefore are of no value in pursuit of a decision. A comparative survey of their structure indicates the cotton thistle, (*Onopordon acanthium*) as the Scotch thistle in America and most botanists so credit it now. Though no light of legend nor brightness of song hover near its tasselled blooms, the broad hoary leaves, the stout stem, the formidable spines that repel all advances of friendship so like the touchy Scot, manifest its ancient and royal lineage. One prickly enemy in boyhood was the *Cnicus acaulis*, the low stemless thistle. It lurked low in the grass and unshod feet suffered well for thoughtless treading on the testy leaves.

The aromatic pennyroyal (*Hedeoma pulegioides*) and boneset (*Eupatorium perfoliatum*) reputable and honest members of the domestic meteria medica, are usually tenants of the pastures and roadsides. The aroma of our pennyroyal resembles the true pennyroyal of Europe, *Mentha pulegium*, and is decidedly a faithful alleviator of the disagreeable colds of winter.

Hartford, Conn.

INDIAN TREE AND PLANT MYTHS.

Once you have inspired confidence in your *mallee* and can get him to speak without reserve on the mystic wonders of the vegetable world, you would hear marvellous stories and myths, compared with which the legends and superstitions that still linger in our old-fashioned English villages are absolutely tame. There is a belief in the South of India that any bare-footed person who happens to tread on a "Burdock" datura plant, would immediately become intoxicated and losing his way, wander miles and miles out of his correct path. There is another mystical plant, the identity of which none of my informants could help me to establish, a single leaf of which, if shown to an angry cat, would at once hypnotize the creature and prevent it from moving a single limb. Of flowers, trees and plants which are the favorite abodes of malignant demons, the people of this country believe in a good many. There is the sweet-scented jessamine, for instance. In some parts of the country, the people never plant it in front of the house, for fear a certain wicked imp may take up his abode in the branches

and cause injury to the inmates of the house. Jessamine blossome are usually selected by evil spirits who are enamoured of women and wish to make known their sentiments. In such cases, the flowers will be placed beside the woman, particularly on the surface of the water when the woman goes for her morning dip in a tank or a bathing ghat. Jessamine flowers are also popularly supposed to be the favorite food of a certain fastidious species of cobra. There is an amusing belief connected with the Belleric Myrabolam tree, (*Terminalia Bellerica*). It is said that if a splinter from the wood of this tree should get into one's flesh, the quickest and most effective remedy is to go in front of a cotton tree and complain thus:--*Tani* uncle, *Tani* uncle, *Cheru* uncle has deceived me."

An interesting legend regarding the bael tree is that it sprang from the milk of Shree, the goddess of abundance. It is frequently alluded to in ancient Sanskrit poems as an emblem of increase and fertility. Even more interesting is the belief, still full of vitality among the Hindus, that in the end of time all Nature will perish, except one mystic banyan, at the foot of which the deity will be enthroned. Another quaint superstition, brought to this country by the Arabs, is prevalent in some parts, to the effect that rain could be induced to fall during a period of drought by simply setting fire to the twigs of the Madar plant (*Calotropis gigantea*), after tying them to the tails of wild bulls.

It would indeed be surprising were there no superstitions connected with the sacred basil plant (*Ocimum sanctum*) which is in such great demand for Hindu religious rites and ceremonies. The plant is sacred to Vishnu, and is said to have been produced from the hair of a nymph beloved by him in his incarnation as Krishnan. Oaths are made on basil leaves steeped in water. The leaves are held in the hand and swallowed after the oath has been uttered. Indeed, basil is held in the same veneration by the Hindus as vervain (the common English *Verbena*) was by the ancient Romans and Persians, and subsequently the Druids of the forest fanes of old England. Just as vervain was long considered a sure protective against witchcraft and the stings of venomous snakes, so the holy basil is looked upon by the Hindus as a safeguard against evil supernatural influences, the leaves of one variety be-

ing employed by native herbalists as an antidote to snake poison.

In connection with the sacred peepul, (*Ficus religiosa*) which by the way, bears such a close resemblance to our English poplar, there is a belief that the god Badavaugny, in the form of a mare, resides in its branches. Vishnu is said to have been born among them and Siddhartan became Buddha while seated under a peepul in a Behar village. This identical tree is still piously believed to be in existence, and a tree growing at Anuradhapura in the Spicy Isle is said to be a branch of that in the Behar village. When the peepul leaves quiver, like those of our own aspen, the trembling is attributed to spirits agitating each leaf. Then there is the neem tree, (*Melia indica*) around which, owing no doubt to its several valuable medicinal uses, a halo of pretty superstitions has clustered. The natives say that longevity is to be obtained by sleeping under the shade of the tree and that the smallpox goddess will go past, without entering, the house from the door of which a bunch of neem leaves is hung.--*Indian Gardening*.

TEA AND COFFEE AS MEDICINE.

The *Globe*, quoting Sidney Smith's remark that "he was glad he was not born before tea," reminds us that there is something of a chock in reflection that the much beloved tea was primarily looked upon as a medicine. Fancy our descendants of a thousand years hence boasting of being "great castor-oil drinkers" or priding themselves on their own particular blend of "rich sirupy rhubarb magnesia!" But despite its extravagant price--sixty shillings a pound it is said to have been given--and the fact that it was considered the sort of thing most appropriately sold by tobacconists, tea made its way, and we find Pope and Young and Cowper and a score of others making their female characters drink "bohea" and eulogizing or satirizing them according to their personal views. Coffee would seem to have had a somewhat similar origin of discovery to that traditionally related about the Bath waters. Of the latter it is told that King Bladud discovered that his ailing swine were cured by bathing in and drinking the waters of a certain spring. What was good for pigs must His Majesty thought be good for men--and the Bath waters retain

their reputation to this day. And one day the head of a Dervish brotherhood in Arabia noticed that whenever his goats partook of a particular shrub they became more vigorous and wideawake in their caperings. So he resolved to try whether some infusion of the berries from this same shrub might not wake his "monks" from chronic lethargy that afflicted them. The stimulating and enlivening effects of coffee brought it to the front, and we find that the earliest patrons of the coffee-houses which introduced it were considered wild fellows and "sad dogs." Later on complaints of quite another kind were urged against it. Coffee drinking, it was asserted, would inevitably impair the productiveness of the race, and humanity unable to perpetuate itself would disappear from the face of the earth. But coffee survived this, and equally malicious assaults.--*Indian Gardening.*

NOTE AND COMMENT.

WANTED.—Short notes of interest to the general botanist are always in demand for this department. Our readers are invited to make this the place of publication for their botanical items.

SEEDS OF LOTUS EDIBLE.--The seeds of the lotus (*Nelumbium lotus*), the well known cultivated plant, are eaten as nuts by the Chinese and other natives. When ripe they are peeled and eaten raw.--*Indian Gardening.*

MOSSES USED IN MILLINERY.--In the November *Bryologist*, Mrs. E. G. Britton notes that *Climacium dendroideum*, is also used in millinery, and that *Hylocomium proliferum* is used in the manufacture of moss-roses.

"FAREWELL TO SUMMER."--Mr. Graves' note on the name of last rose of summer, applied to the New England aster (*Aster Nova-angliae*) recalls the fact that this plant is also known by the appropriate and poetic name of "farewell to summer."

RANGE OF THE BIRCH.--The birches are trees of boreal range. Unknown in the Southern Hemisphere and the Tropics, they abound throughout the northern and mountainous sections of North America, Europe and Asia, reaching a more extreme northern range on both continents than any other trees.--*M. L. Fernald in American Journal of Science.*

THE IMPATIENT BLOODROOT.--At least seven months before it is ready to bloom, the flower bud of the blood-root (*Sanguinarea Canadensis*) is formed. One may dig up the plant in early autumn and pulling apart the sheathing bracts, disclose within them the flower, half an inch or more in length, snugly wrapped in the single leaf. The blood-root is not unique in this characteristic, however, for the buds of nearly all the plants composing the early spring flora are formed in autumn; but its flower bud is probably the largest and most easily seen.

FRUIT OF THE POLYGALACEAE.--The milkwort family, to which our flowering wintergreen or fringed polygala (*Polygala pauciflora*) belongs is seldom thought of as producing edible fruits. In fact according to *Indian Gardening,* the only eatable fruit of this order is that of *Xanthophyllum obscurum,* a large, often huge, tree with deep shining green leaves and white flowers. The fruit is as large as a cricket ball or larger, with a thick rind enclosing several seeds wrapped in a sweet white pulp.

THE LARGEST FRUIT IN THE WORLD.--When we are ready to award the prize for the largest fruit borne by any plant it is probable that the humble pumpkin vine will bear off the honors. If asked to instantly name the largest fruit, the pumpkin would scarcely come to mind, but more leisurely reflection points to this as the correct answer. One would naturally look to the Torrid Zone, the home of botanical wonders, for such a prodigy. In this connection the question which is the largest seed? comes up. Is it the cocoanut? Will some reader familiar with the botany of the world tell us?

TEA DRINKING IN BRITAIN.--If they are looked at in a proper light statistics are by no means dull reading and may supply some most interesting facts and subjects for speculation. The returns of the imports into Great Britain of tea and coffee open up some very curious questions. The average Englishman drinks in the course of the year, six times as much tea as the average American or Dutchman and very nearly 100 times as much as the average Frenchman. On the other hand, the Englishman does not drink coffee and only gets throug in a year about a twentieth part of that which the average Dutchman consumes.--*Indian Gardening.*

THE WHITE PINE AND STORMS.--A writer in *Forestry and Irrigation* notes that all the commercially valuable forests of white pine (*Pinus strobus*) are found in the regions of greatest storm frequency in the United States. To be to the white pine's liking a region must have an atmosphere containing a high percentage of moisture, with much cloudiness, frequent small rains and snows uniformly distributed throughout the year and a relatively low temperature. The total annual precipitation in the "white pine belt" is from 30 to 40 inches. The snow falls early and stays late, the average annual fall being about 50 inches on the southern border and 150 inches on the northern.

THE LONGEST FLOWER-STALK.--Probably the longest, if not the largest, peduncle is that of fourcroya (*Furcroea gigantea*). It is frequently over forty feet in length and has a diameter of six to eight inches at the base. Such an organ being exceedingly expensive, the plant takes due precaution that, in case of accidents thereto, there shall be at least one way in which it can retain its immortality in the shape of living counterparts. The plant seems to be arriving at the conclusion that flowers are too uncertain a luxury; it relies much more upon bulbils, and thus the generous proportions of the peduncle become necessary in supporting their enormous weight.--*O. W. Barrett, Mayaguez, Porto Rico.*

FRINGED GENTIAN EXPERIMENTS.--In this issue Mr. Plitt makes an important contribution toward a solution of the puzzle which the irregular occurrence of the fringed gentian (*Gentiana crinita*) forms for botanists. As a point for other experimenters to consider, it is suggested that possibly the plant may sometimes occur as a "winter annual," that is, the seed may germinate in autumn and produce small plants which endure the winter and bloom the following autumn. Certainly those small plants containing but four nodes and bearing one small flower cannot be considered biennials. Perhaps the difference is size and time of blooming is determined by the time of germination in spring or fall.

MYRMECOPHILOUS FERNS.--Several different species of plants have either developed structures designed to attract ants to them for residence or have produced structures that have been taken

advantage of by ants for this purpose without design on the part of the plant. A recent report on two species of Malayan ferns of this kind describes the root-stocks as being thick and fleshy with a gallery in the interior running lengthwise and giving off two lateral series of galleries to the branches and leaf bases. These branches are connected with longitudinal chambers in the dorsal half of the rootstock. Ants are said to invariably inhabit these galleries and as the ferns develop no external openings to them, the ants have to make these for themselves in the softer parts of the plants. The ferns are both species of *Polypodium* and grow upon trees.

Generic Names and Nomenclature.--Editor Grout of the *Bryologist* has never been charged with being a conservative in matters nomenclatural, but he has a sensible way of looking at certain changes in scientific names that does not include him among the radicals. The following refreshing observations are taken from an article in the November *Bryologist*. "The selection of generic names which will stand every scrutiny is respectfully offered to the logicians of today as a worthy substitute for the discussion of the famous syllogism proving motion impossible or perhaps it would prove as effective in promoting learned argument as the discussion of how many angels can stand on the point of a needle. * * * Many of the rules made by the reformers of nomenclature are wisely chosen, but the avowed purpose of some of them to make the whole matter of botanical nomenclature depend on a set of rules to be mechanically applied with no reference to previous usages, savors of the methods of the middle ages."

Revision of the Birches.--Mr. M. L. Fernald who has been studying a large series of birch specimens, is of the opinion that too many forms of our white birch have been given specific rank. These trees like many other plants of the far north are very closely related to European and Asian species and Mr. Fernald says it is possible to trace by a series of specimens, a direct connection from one to the other. Our paper birch (*Betula papyrifera*) he regards as identical with the white birch (*B. alba*) of Northern Europe and our species should, therefore, be called by the latter

name. Under *B. alba* he places the varieties *glutinosa, cordifolia, minor* and *carpathica. Betula pendula* of the old world and its variety *Japonica* are said to represent the two forms recently described from America as *B. alaskana* and *B. kenaica. Betula occidentalis* is considered to be only a form of *B. alba.*

THE ORNITHOLOGIST AND BOTANIST AGAIN.--We were somewhat surprised at the number of orders received for the files of this journal offered in the September number of AMERICAN BOTANIST. There are still twelve sets left, if others desire them. Each set contains ten numbers of eight pages each, and a set will be mailed for ten cents. The journal was the first official organ of the Gray Memorial Botanical Chapter and contains a good proportion of plant lore that is still of interest. Address this office.

THE HELIOTROPE AS A FEVER CURE.--Among our most valued ornamental plants, says *Cosmos,* is the helitrope, not because its beauty, form, and color are specially remarkable, but because it flowers abundantly throughout the year and is particularly fitted for bouquets, its suave odor being specially sweet and agreeable. Now, as if these qualities were not sufficient, a more serious one is attributed to it, namely, ability to cure fever. The ancients, we know, notably Dioscorides recognized this property and in the sixteenth century, if we may believe Bauhin's "History of Plants," its seeds were prescribed to be taken in wine for quartan fever; but in our day of light and progress, who pays any attention to the ancients? So like so many other beneficial plants, it has been cast into oblivion. Now, however, Dr. Pilotoff, of Moscow, has rehabilitated it in a memoir presented to the Russian Academy of Medicine and affirms that the heliotrope can be substituted for quinine in medicine, having all its advantages without any of its inconveniences. He adds that for many years it has been used in Persia, Turkey and parts of Russia as a remedy for fevers with success. "Its mode of preparation is very simple consisting merely in macerating the stems and leaves in brandy." The writer adds that there is now a passion in France for everything Russian, the new medicine evidently opens a rich field for the horticulturist.

EDITORIAL.

With their usual ability to perceive the fitness of things, the editors of the *Plant World* chose their "souvenir" number as a medium for throwing a large quantity of mud--and very black mud, too--at the AMERICAN BOTANIST and its editor. The editors were evidently in what is known as "a state of mind" when they took up their pens, and all because we do not believe America needs two plant protection societies and have had the hardihood to mention it. To us it seems that if we really mean plant protection, the best way to accomplish it is to help on the work of the original Boston society, but if our object is to brace up the failing circulation of the *Plant World*--why that is another matter. In fact that is the only matter that makes a second society desirable, regardless of how "national" its scope is made by means of honorary officers. The *Plant World* editors are excited and should avoid all stimulating literature for a time, especially the AMERICAN BOTANIST.

The Fern Bulletin celebrated the completion of ten years of uninterrupted publication by making a special number of the October issue, in which are printed articles upon fern study in various parts of the world as well as a complete survey of fern study in America. Although a comparatively youthful journal, it is already the third oldest of American botanical publications, excluding those devoted wholly or in part to horticulture. During its existence it has witnessed the demise of several larger and more pretentious journals for the way of the botanical publication is, at best, rough and beset with many difficulties.

At the beginning the *Fern Bulletin* found it necessary to "make" its own public. At that time people interested in the study of ferns were exceedingly few and to have begun with a magazine like the present one, would have meant failure through lack of support. The first issues were therefore rather small and insignificant, but they rapidly improved with a growing clientele. The number of pages has increased half a dozen times, at least, and at present thirty-two pages are published each issuse. The magazine is now on a safe financial basis and in this respect is probably unique among American publications of its class.

The case of the AMERICAN BOTANIST finds a parallel in that of the *Fern Bulletin* for it, too, has in a measure, had to make a public for itself. Botanists there are in plenty, but botanists who appreciate the study of plants as living things are still as rare as fern students were ten years ago. It is not that the botanists are incapable of taking an interest in such studies, but that they never have had the way opened for them to do so. It is the privilege of this journal to be a pioneer in the new field and to awaken an interest in the habits of the plants about our doors. Interest in collecting plants fails when there are no more rarities within reach; species making must end when the last variant is tagged with a name; possibly wrangles about nomenclature will in time cease; but once one begins to see new beauties in species that are neither new nor rare, he is started in a line of work that will never pall upon him. This is the newer and better botany which we feel sure will ultimately surpass all others and we are building the AMERICAN BOTANIST along lines that conform to it. Just as fast as our following increases, the magazine will be enlarged and every reader who mentions the journal to a friend, helps on the movement.

The much advertised "wooden wedding" number of the *Plant World* appeared without the promised portrait of the senior editor. It is explained that it could not be prepared in time for that issue. Evidently he had been comparing the AMERICAN BOTANIST with his own journal and could not thereafter work up the necessary "pleasant expression."

BOOKS AND WRITERS.

"Postelsia" is not the name of a new breakfast food, however much it may sound like it. It is the title of the year book of the Minnesota Seaside Station and the initial volume is said to contain seven essays mostly relating to algae. The book is printed on Roxburgh laid paper and bound in maroon silk with gold embossed book-plate by Rosendahl and no doubt shows at every point how completely art has become the handmaid of science. The edition is limited to 250 copies at $3.25 each, and as no copies are to be sent for review, the poor editor who, like the country

minister, has to depend upon donations for this sort of thing, cannot give it a more extended notice. The scientist will no doubt luxuriate in his Roxburgh edition, but we suggest that when the next volume is published, a few sheets of just common old white paper be fed into the press to make a book or two for the editors.

We note with regret that the publishers of *Meehan's Monthly* have decided to discontinue the magazine at the close of the present volume. For twelve years it has stood as a model of what a journal of popular botany should be and its disappearance will leave a blank that other journals will imperfectly fill. It is to be regretted that a journal so ably edited and so full of real worth should not find sufficient support from the flower loving public to justify its continuance.

"The plants used by the Indians of Mendocino county, California," is the title of a valuable publication recently issued by the United States Department of Agriculture as a contribution from the National Herbarium. These Indians have only been in contact with civilization for about half a century and as a consequence still retain many of their former customs. It is the opinion of the author, Mr. V. K. Chesnut, that several of the wild plants used as food might be introduced into the gardens of civilized men with good results.

Dr. B. L. Robinson's "Flora of the Galapagos Islands" issued as a contribution from the Gray Herbarium of Harvard University under date of Ocober 28, 1902, is a general revision of the peculiar flora of these little known islands, made possible by the collections of the recent Hopkins-Stanford Expedition. There are now 537 flowering plants and ferns known from this region and these belong to no less than 323 genera. A remarkable characteristic of the flora is the number of endemic species that occur. Forty-five per cent, or nearly half the species, are found only in these islands. Thirty-nine out of the seventy-two families of plants represented, contain endemic species, the Compositae, alone containing thirty-nine and the Euphorbiaceae twenty-five. The genus *Scalesia* is found only in these islands and, most singularly several of the islands have each a species of it that is not found on any of the others.

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A MONTHLY JOURNAL
FOR THE PLANT LOVER

NOVEMBER, 1902.

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THE AMERICAN BOTANIST

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VAGABONDS AMONG THE FLOWERS.

BY CHARLES D. TURNBULL.

At the old cross-roads school, book in hand and stoutly booted feet awkwardly toeing the line at various angles, our grand-parents stammered and struggled through the lines of the "wheat and the weeds," in their old brown covered readers. The verses recounted the experiences of "three youths in city bred," who had rambled for pleasure's sake among the green fields and budding trees of the country. "Of herbs and grain they little knew, what Linaeus wrote or Sinclair grew," and each as he strolled along expatiated upon the beauty and fragrance of his choice of flowers but all condemned the rising blades of green composing the wheat-fields, as unworthy of such bright companionship.

"A Farmer chanced behind the gate
To overhear the youth's debate,
And knowing from ignorance error springs
He strove to teach them better things.
'My lads,' he said, 'now understand
These are the weeds that spoil our land;
But the green blades you trample down
Are wheat, man's food and Nature's crown.' "

These lines illustrate the prevalent and conventional distinction between the flowers and the weeds. Our grandparents probably pondered wonderingly and failed to understand why these flowers so beautiful should be ruthlessly condemned as weeds, these flowers so bright could not be weeds. But in after years they tilled their many acres and entered the eternal fight against the weeds and then hard experience taught them the distinction between Nature's crown "and the flowers that blossom so fair in the sweet summer time."

A convential definition of a weed is any one of those herbaceous plants which are useless and without special beauty or especially which are positively troublesome. Whether a plant be a flower or a weed is often dependant on that pair of eyes through which we view it. Under the second clause of this definition the white daisy of the May meadow, (*chrysanthemum leucanthemum*), the inspiration of poets and admired by all through its virgin beauty, is denounced as whiteweed by the farmers. In a practical sense a weed is not necessarily a flower possessing no esthetic beauty nor does possession of such quality protect it from the brand, but should it prove troublesome to mankind through unusual productive powers and rapidity of growth, it immediately looses caste and becomes a vagabond flower. Our black eyed Susan (*Rudbeckia hirta*) and wild carrot (*Daucus carota*) equal in beauty many pampered garden blossoms, but partaking of the pernicious qualities of weeds, they are forever and eternally at arms with the farmers, and in my state, the wild carrot has long since been outlawed and relentless war is proclaimed against the tribe, which however, continues to spread and increase, and flaunt its banner white defiantly from all the countryside.

The majority of Nature's lovers prefer the first clause of the definition as the most accurate and felicitious, for does not the entirety place all flowers under the possibility of carrying this brand of floral disgrace? True to nature conferred on all, the plant in its congenial soil, location and clime, will flourish and increase. Perhaps in their native soil many exotic weeds are honored and respected flowers, but in the unfortunate day when they secured a stolen entrance along with honest seed into our regions, their downfall was immediate. They proved fruitful and abundantly multiplied, spread over the land and graced the wayside walk or the brown barnyard floors; and that saying, concerning familarity which breedeth contempt is as old as the brown hills themselves and applies also to our weed.

The lesser weeds compose the entire urban flora; the delicate colored species from the fields and hills possess none of the tenacity and vitality of the weed that is so necessary for their urban life. We may liken the field flowers growing in cities to the in-

tensely natural savage, who languishes in pines under civilized restraints; the weeds to that hardy savage with some taste of civilization, that has adapted himself to his conditions and flourishes under amazing restrictions.

They hold a bare, unvegetated spot to an abnormal condition and seem to consider it a point of weedy honor to clothe these naked places on the bosomof mother earth, but there would be fewer complaints were they to confine themselves to the wayside and barren assigned them by the Lord of the earth, and not strive so stoutly to fulfill their office on spots uncovered by men. Even stonewalks in neglected estates are covered from sight by the activity of the knot weed (*Polygonum aviculare*), that embodiment of weedy qualities. The first season, from the edge of the flagstones, it spreads a hardy crop of vegetation. Wandering gusts settle layer upon layer of dust over the plants till they are submerged and life is departed, though not until they have attained their end by producing seed. A later crop springs into life upon this shallow soil and they repeat the operation. This continues the third season and the fourth and in a very short time where was once the walk is the green stretch of weed. Portions of city streets not subject to much traffic must be hoed during the summer months to prevent them acquiring a rural appearance owing to the activity of this vegetable rodent.

Hartford, Conn.

NOTES FROM PORTO RICO.

By O. W. Barrett.

The sensitive plant (*Mimosa pudica*), is one of our worst weeds in pastures here. It's sharp claw-like spines cause almost as much profanity among the field laborers as do the ant nests. It attains a length of six feet or more rambling about in the grass and low bushes.

The Ceylonese *Alocasia macrorhiza,* likewise has a bad reputation here because it preempts the choicest plats of moist, rich soil and carries out the squatter policy most successfully. When left unmolested for a few months it reaches a height of 6 to 8 feet,

though, of course, practically stemless. Having found the aristocratic and highly decorative variety, *A. macrorhiza variegata* growing in the midst of a clump of the green "parent" species, it looks like a case of caught-in-the-act sporting; at best I can never be more than civil to *variegata* hereafter.

Speaking of ornamentals, let me record the achievement of a *Crinum amabile,* in our grounds. It had been starving on an unmixed diet of red clay until a few months ago when I began a series of menus which have "gone right to the spot," as it were. The bulb weighs, I judge over 30 pounds and is some 2 feet long; it now has two 4 foot peduncles bearing 29 and 32 flowers respectively; the leaves are 6 to 7 inches wide and about 4 feet long. The perianth tube is 5 inches in length and the petal-like segments are 7 inches; this means the open flower is a foot or more across and its size together with the exquisite coloring, which ranges from pure white to deep purplish red, render it a thing of rare beauty--a sight to remember. Thirty is stated to be the maximum number of flowers per peduncle; two peduncles at once is a very rare event; therefore, I respectfully challenge any reader of the AMERCIAN BOTANIST to beat the above record.

Mayaguez, Porto Rico.

PLANTS IN WINTER.

By PROF. W. W. BAILEY.

We are apt to think of all plants as lying dormant in winter. As a matter of fact many of them are very much alive. If we cut open a crocus bulb or that of a tulip, we find the fully formed flower-buds within, and most beautiful objects they are. Still, every one knows that the crocuses planted in November will not appear above ground at the earliest till sometime in February.

If they are all ready to develop--as they seem to be, why do they not at once come up? A very natural reply is, that the weather is too cold. The answer is not satisfactory; it is often just as inclement or even more so when they finally do appear. The height of the thermometer then has not been the sole factor. No; our bulbs have been doing good earnest work under ground. Attempts to force the snow-drops by mere increment of heat have

failed disastrously. While they develop foliage and an inflorescence after a fashion, they do not form perfect flowers and they perish early with aims unaccomplished. Four months later the normal growth takes place even at a very low temperature.

Many seeds, rootstocks and tubers act similarly. In all such cases the materials contained in the cells are vitally active. The contents of their cells slowly pass through various chemical changes, preparing them for their future function. Neither heat nor moisture will hasten this transformation.

It is right enough then, after all, to speak of a time of dormancy if we do not carry it far enough to involve the idea of death. A seed, bulb, potato-tuber, are inert enough surely, but they are potential with life. A comparison is sometimes made between them and a lucifer match. The latter, too is quiet enough, and may remain so for months or years. When heat or friction is applied, a key has been touched which sets tremendous energy into being. We have violent oxidation with its accompaniments of heat and light. Several springs must be plied to start up the vital engine in a plant. There is oxidation here, also, but accompanied by the subtle, elusive, mysterious force called life.

Of course we all know that certain plants, very many, may have their resting period, their long vacation, shortened without harm. These, like hyacinths, will respond even in November or December to the stimulus of heat and moisture. By mid-January certainly and perhaps earlier, one can force a budding spray of *Forsythia* into a golden splendor of bloom. We even see lilies-of-the-valley and lilacs, neither of them naturally early bloomers, thus compelled to blossom in winter. It stands to reason that it is easier to do this with plants whose time of blooming is early, the Mayflower, hepatica, cherry, willows, alders, birches and the like.

Kerner tells of a curious and instructive experiment he once tried. He drew the shoot of a clematis plant rooted in the open, after it had lost its foliage in the autumn into the interior of a neighboring hothouse. Leafy shoots were developed from the buds of the upper portion thus warmed even in December; while the lower portion of the same plant, situated outside the hot house

and surrounded by cold air, was still frozen. This plant, it seems could draw at once upon the constructive materials deposited in its reserve store-house.

There are various parts of a plant which serve as such treasure-vaults. To them, all summer long as to a bank, there is a constant inflow of deposits. Roots or parts of roots, stems or parts of such, scales, etc., may all be employed for storage.

Providence, R. I.

PLANT INTELLIGENCE.

By M. F. Bradshaw.

In observing and studying nature the thing which impresses and grows on one is the mind, the intelligence displayed. In some plants more than instinct is apparent and reason of no low order can be seen. Every one knows how most plants secure pollination by bees or other insects. So various are their devices, so beautiful the arrangement of their parts for the desired end, we are lost in wonder more and more as we examine one after another.

How many people look at the nettle with any degree of interest--a thing to be dodged as we reach for a neighboring flower? And who has solved the meaning of those vicious stinging hairs? Until this year, I never gave the plant more than a passing look, but one day, not long ago, something inspired me to take home some of the tall spikes of the creek nettle (*Urtica holoserica*) for study. The flowers look like stringy catkins and are disposed in full clusters in the axils of the leaves.

The two upper clusters were green while those below were white and one naturally supposed the green ones to be immature flowers or buds. But placed under an ordinary lens they proved to be pistillate blossoms, while the white ones were staminate. They are apetalous, that is with calyx and no corolla and they were all closed--little white globes.

A touch with a needle and--pop! they fly open and four stamens are there, the filaments twice as long as the lobes of the calyx and standing curved, cup-like, each with a comparatively large globular anther. At first I thought it surprising that the stamin-

ate flowers should hang below the pistillate, for how then could the pollen reach the stigma, till I remembered how some plants desire cross pollination.

Now how wise is this despised nettle! First, it knows that cross fertilizing produces the strongest plants, then to prevent self pollination, the flowers containing the pollen are set below the ones that require it to form the seeds. But the pollen is not to be allowed to waste by falling or being blown away by every wandering wind; it is guarded by the closed calyx till a bee alights there, when up fly the four anthers and must literally clasp the head of the bee. I do not know what in the sober green pistillate flower attracts a visit any more than I know the meaning of the stinging hairs on the stems, but doubtless nectar is there and manages to make its presence known.

Orange, Cal.

SOME ORCHIDS AND FERNS OF CONNECTICUT.

By Angie M. Ryon.

The farm house in which I spend half of each year stands on a somewhat rocky ridge between two wooded swamps. The difference in plant life between these two low lying tracts is a matter of considerable interest to me, for while they are in many respects similar, there is much of individuality in the plant life. This is the more striking because the two tracts are quite near together, and run in nearly the same direction.

In Red Brook swamp I find that tiny orchid *Microstylis ophioglossoides*, adder's mouth--growing in the blackest of mud in thickets of the most impenetrable kind, under tangles of wild grape vine and poison ivy (*Rhus toxicodendron.*) So effectually is this shy little denizen hidden that I must hunt long through these dark tangles ere I find the coveted little green heads of bloom. Such a quaint little thing! A veritable "symphony in green." Leaf, stem and flower, all the same deep grass green, and often the bulb is quite green. The first time I came upon this little oddity after a good hour of steady fighting against bush and brier, I was quite amazed to think I had found it at all. It was so tiny and so hidden. Growing in its immediate neighborhood I find the inconspicuous greenish flowers of *Habenaria tridentata.*

This is usually more easily found, and is here much more abundant than the adder's mouth. Near these I occasionally find *H. ciliaris,* but the growth is mostly too dense here for this lover of the sunlight, for it needs the bright orb to paint it in glowing color. *H. lacera* blooms among the dark shadows of swamp maple and pepperidge.

For several years I have never failed to find the large blue-green velvety leaves of *Arontium aquaticum*--golden club--in the brook which runs through this swamp; but this year for some unexplainable reason my attractive neighbor was absent, and the brook really seemed to miss it and I felt lonely to see the empty spot where my old friend had been for so long. Why it died I cannot guess. Close by in the dusky aisles under the largest old swamp maples grow fine plants of *Aspidium simulatum.* Such lovely great fronds of tenderest green! I must handle them carefully indeed if I am to get them out of this thicket undamaged. This is to me a beautiful variety, especially when it grows in this spot. A bit lower down the brookside I find quantities of narrow-leaved chain fern (*Woodwardia angustifolia.*) This fern seems to need sunlight in order to send up its dark stemmed heavily fruited fronds. Here too are tall glowing stalks of the cardinal flower (*Lobelia cardinalis*) a dazzling beauty. Just beyond the swamp and in the low woodland adjoining I find the quaint blossoms of that curious orchid *Pogonia verticillata.* I frequently haunt this odd little company as long as the flowers last. Their long dusky purple and green sepals are so odd, the dainty purplish lip with the pretty odd little crest, the whorl of green leaves and the maroon green stalk with its "bloom" all combine to make this little plant seem to me the very embodiment of the time of bursting bud and flower. From the prevalence of the same tints of green, maroon and brown in plant leaf and soil which surround it, as well as its own low stature this little plant is not easy to find.

In the east swamp I find the cardinal flower has thrust up bright wands all along the brook. I also find *Habenaria tridentata* in the sphagnum bogs but the little adder's mouth is entirely absent as is also my favorite *A. simulatum.* Not one plumy frond of it can I find for all my vigilance, neither in the more elevated wood-

land do I find even one flowering plant of *Pogonia verticillata,* although after long search I found a few low plants of it which ever refuse to flower. But here I find strangers who never frequent other nearby wooded swamps. Here I find that queer freak of the fern world *Aspidium crestatum* x *marginale.* There are but two plants of it in all the great swamp, for I've searched faithfully up and down, hither and yon. These two plants throw up long fronds, many a full yard in length and in such a variety of forms! Looking as if by some misfortune, or some depredation of beetle or worm to have been badly mutilated. But I think nothing has troubled their development but their own "cris-cross" proclivities. I know of no such oddity in flower or fern as this. Close beside it are four beautiful plants of *Aspidium boottii.* This is absent from the adjoining swamp also. On the slightly elevated woods near this tract I find instead of the odd Pogonia a great profusion of *Liparis liliifolia* and occasional plants of *L. Loeselii.* in this swamp the poison sumac (*Rhus venenata*) is entirely absent, while it is very abundant in the Red Brook swamp.

New London, Conn.

THE DWARF BLUE CURLS.

By Wm. A. Terry.

In your note on Canning's paper on the lesser from of *Brunella* in July Botanist, you do not comment on his statement that it does not flower. I have been noticing this plant for several years and can state that here in Bristol, Connecticut, it does flower abundantly. The flowers are darker in color than the common form, and are very small, as are the flower heads also, which grow nearly sessile and frequently in contact with the ground. Last season I noticed in the lawn of the Public Library and in several other lawns on High street, patches several feet in diameter, that were so blue with flowers as to be visible several rods away. On my own lawn a space twenty feet in diameter was covered with flowers. Canning speaks of its vegetative reproductive qualities Last season back of my house, beside the driveway, a plant came up, apparently from seed, of such mammoth proportions that I hesitated about calling it *Brunella,* until late in the season it com-

menced to flower. It formed a clump two feet in diameter and about two feet high, with numerous flower heads. The flower heads and the individual florets also, were as much larger than the common *Brunella* as that is larger than the lawn variety (*Nana.*) The flowers were also much lighter in color. In a yard near the Congregational church grows a plant of a somewhat related genus which I take to be *Ajuga reptans.* It has a whorl of purplish blue flowers around every node from near the bottom to the top. Beside these is another patch that has pinkish flowers and another more slender variety with white flowers. A lawn on High street a few years ago was covered with the meadow cress (*Cardamine pratensis*). This has a broad flat topped cluster of pinkish white flowers, somewhat like the pepper root, (*Dentaria lanciniata.*)

Bristol, Conn.

SOME DECIDUOUS TROPICAL TREES.

By Mrs. E. C. Anthony.

Having supposed from childhood that tropical trees were evergreen, the changes and dropping of foliage in Nassau were very interesting. The silk-cotton tree (*Ceiba*) always an interesting tree from its great size, the massive buttresses that support its trunk, and huge horizontal limbs, is still more so from its peculiarity of succession of leaf and flower. It has been said that one should have it under examination for three years, in order to see the whole round of leaf, flower and fruit.

There were five magnificent specimens in front of the hotel which were the objects of notice. One in particular was in full leaf the last of November. How long it had been so, I do not know. About Christmas time the leaves, which resemble those of our Horsechestnut, began to fall, and this process continued three or four weeks, when the tree became entirely bare--this state lasting about two weeks. Then gradually and slowly the flower buds began to show. It was a month before the tree was in full bloom, and attracting hosts of insects and many humming birds, with its sweet, heavy odor. The very short time during which the blossoms lasted hardly seemed to compensate for the long process of getting ready. The formation of the

pods was equally slow, and it was the last of March before they grew sufficiently to be markedly evident. One of the trees which last year was bare all winter, this year (1902) was in full leaf, and did not change. Another one dropped its leaves from one-half of the tree, and put out blossoms and pods, while the other half remained green. Each tree seemed to be a law unto itself, and apparently not affected by outside circumstances.

A Demerara almond tree which was in full leaf and fruit at Christmas began to change and drop its nuts and finally its leaves in February. The leaves resemble those of the Magnolia, and in changing are many of them as brilliant in color as our brightest maples. It was entirely bare by the first of March, and so continued for perhaps two weeks when it surprised us by putting out tender green foliage, which was half grown by the end of March.

Gouveneur, N. Y.

SOME MUSHROOMS FOUND AT MT. POCONO.

By Mrs. E. M. Dallas.

It would be impossible in this paper to enumerate and still more so to describe all the mushrooms I found this past summer. I have selected a few of the most remarkable, either for looks or for rarity, and will briefly mention them. The country around Mt. Pocono is certainly favorable for the growth of all fungi. After a season's experience I learned two or three facts about it. First that there were few of the genus *Boletus* to be found there, and comparatively few of *Lactarius*. Then I discovered there were a great many of *Marasmius*, and lastly that if there existed but few species of any one Genus, that those few would be what is called in the books, *rare*.

To begin with the genus *Boletus*, there is none more striking in appearance than *B. spectabilis* or the showy Boletus. Prof. Peck describes it in his book as a rare, showy species, which inhabits cold northern swamps. When I saw it, it was growing in marshy ground. There were great numbers of it in various stages of growth. The young plant was covered with a veil and the caps were spotted with reddish scales and had a viscid appearance. Perhaps *Boletus bicolor* which I also found is a handsomer fungus. The two colors from which it obtains its name are red and

yellow. The cap is red and the tubes and flesh are bright yellow while the stem is red below and yellow at the top. It is well named and easy to distinguish from others. The tubes and flesh slowly change to blue when wounded. These two species with *Boletus subaureus* were the most striking ones that I found. The pale golden Boletus has the cap, tubes and stem all yellow. The stem is yellow within and without. It somewhat resembles *B. Americanus,* but is stouter, and has smaller tubes of a clearer yellow. *Cantharellus floccasus* called the trumpet chantrelle has been described by Professor Peck in his 52nd report. It is a most distinguished looking mushroom. It grows in the woods, and its rich orange color and the wooly scaly appearance of the cap and its trumpet-like shape render it very striking. The cavity in the centre of the cap extends to the stem. The stem is short and there is a variety called *S. brevipes* in which the stem is shorter still. The specimens I saw were all large, whole plant six and seven inches long and four inches across the top. Prof. Peck says it is a good edible mushroom, and one would nearly furnish a meal. The distinguishing characteristic of the genus *Cantharellus* is the fold-like nature of the gills, but there is no fine dividing line between some genera; one often merges into another, and we may find a species in which the typical characteristic is not clearly defined. Such a case exists in *C. umbonatus* which Stevenson says is a rare species. I sent it to Dr. Herbst for determination. Its color was mouse grey, with shining white gills. The cap which was an inch broad was umbonate and then depressed in the center, the surface silky. The stem was gray and fully three inches long and the gills were decurrent, quite crowded and dichotymous. It grew in moss and looked somewhat like a *Clitocybe.*

We found quite a number of *Clitocybes.* There was the beautiful delicate greenish-blue one, *C. odora* and the white Clitocybe *C. Candida* which Atkinson has described and of which he has given two good pictures. It grew on dead trunks of trees in the darkest and thickest part of the woods, in large groups and clusters, by its pure whiteness lightening up the gloomy space around. The plants were large, measuring eight inches across, but the

stems were short and thick, and only three inches in length. The caps were smooth, with their margins turned up and wavy and the gills were adnate-decurrent and crowded. The stems of this species are disproportionally short, considering the width of the cap. The latter is not regular, but is often longer on one side than the other. This mushroom is also said to be good eating. Some of the plants have the stems lateral and so resemble the genus *Pleurotus*. I think they are quite as striking looking when one sees them in the woods, as *Clitocybe illudens*. *Clitocybe trullaeformis* or the basin-shaped Clitocybe, from the word trullae which signifies a basin or ladle, is quite different looking. The color is grey and the shape funnel-like as the name betokens. It is dry and flocculose, and the flesh white. It is much smaller than the ones I have described. The cap is two inches broad and the stem two inches long and like the cap, of a grey color. The gills are decurrent and distant and shining white. It resembles *C. cyathiformis* in color of cap and stem, but differs in the snow-white flesh. These four Clitocybes are the principle ones I found beside the ubiquitous *C. laccata* which pervades every space. One can not walk along any path, in the woods or along roads without seeing it, and the shapes it assumes are manifold. It is a great trial to the beginner who is constantly thinking that he has discovered a new mushroom.

Craterellus clavatus was a new mushroom to me. It affords another example of the indistinct line of demarcation between genera. The genus *Craterellus,* is allied to *Cantherellus,* which is intermediate between *Agaricus* and *Craterellus*. We are all familiar with *Craterellus cornucopoides*. Its blackish-grey trumpet-shaped cap is found nearly everywhere. If a beginner should find *C. Clavatus* he would hardly recognize it as a *Craterellus,* so different is its shape. The name *clavatus* shows that it is club-shaped, and it somewhat resembles the family *Clavaria*. It was irregularly club-shaped, of a pinkish yellowish hue, three inches long and one-half inch wide. The cap was rough and fleshy and it became narrower as it joined the solid flexous stem. The flesh was thick and white. Atkinson gives a fine picture and description of a mushroom that I found for the first time this summer.

It is *Hypholoma rugocephalum*. The regose markings on the cap (like the rivers on a map) only raised and the reddish brown color, shining like varnish, mark it distinctly. I saw it often during the season.

I found at least four new species of *Inocybe*. *I. rimosa* so called from the margin splitting up, *I. asterospora* from the star-like shape of the spores, *I. eutheloides* (which I suppose is almost the same as *I. eutheles*, so called from its prominent umbo, *I. geophylla* of which there is a good picture given in Stevenson, page 252. This latter is of a white or greyish color and the cap only measures half an inch across. It is named *geophylla* from the earthy color of the gills which are at first grey and then earth color. It is an interesting little mushroom, with its conical cap and prominent umbo or rather papilla. We became quite familiar with it.

Marasmius is the genus of which we found the greatest number of new species. There were five or more new to me. One of these *M. resinosa* seemed to puzzle every one. I finally sent it to Prof. Peck and he wrote to me about it. He had at first named it *M. decurrens*, but finding that name appropriated, called it *M. resinosa*. Mr. Lloyd forwarded the specimens I sent him to Prof. Beardslee, as the latter is writing upon the genus *Marasmius* and I believe is glad to get specimens and reports of any new species. I sent over two hundred specimens to Mr. J. B. Ellis, as he wished to use them for Fungi Columbiani as well as three hundred specimens of earth-tongues, *Geoglossum glabrum* for the same work. The *Marasmius* grew on dead leaves in the woods. It was pure waxy white, unlike so many that have the stems black or dark color. The gills, too, were truly decurrent. The young ones were campanulate shaped but the caps expanded as they grew and a little umbo was formed, distinctly marked and giving it the appearance of a derby hat with a narrow brim and round crown. It revived beautifully when placed in water. The fact that *Marasmius* will revive when moistened, makes it easy to keep the plants, and it is the best genus we have, since the specimens can be kept without drying up beyond recognition.

I must not admit to mention the prettiest small mushroom next

to *Marasmius resinosa* that I have ever seen. It is called *Pholiota mycenoides.* Stevenson describes it on page 237. I found it in a clay bank, near a spring. The soil was soaking wet from recent rains, and these tiny mushrooms (there were only a few to be seen) were glistening with moisture. The caps measured about a quarter of an inch to one-half inch across, but were remarkable for the large white ring like a collar, that was around the top of the stem, concealing the gills. The color of the bell-shaped and striate caps was a bright reddish-brown, but some were paler in color. The stems were only one inch long, smooth and a little paler than the caps. The name denotes their resemblance to *Mycena,* but the genus *Mycena* has no ring. The color of the ring was white and considering the small size of the mushroom, it was large and conspicuous. It reminded one of Queen Elizabeth's ruff. Stevenson calls it a remarkable species found in damp dells, which exactly describes its habitat. I do not believe that many of us have found such a tiny *Pholiota.*

The next mushroom on my list is *Coprinus tomentosus.* The specimens we found were beautiful. The caps were covered with a white woolly substance, which came away easily when handled, showing the pale mouse grey color beneath. The plants were small and grew on manure in a grassy place. The caps were conical, about one and one-half inches high and the gills were brown.

Our collection of mushrooms was not confined to Agarics. We found a species of *Xylaria, X. corniformis,* which resembled a roughened black club in shape. It belonged to the class of Ascomycetes or spore-sac fungi. We have often met with *Xylaria polymorpha,* but *X. corniformis* seems to be less abundant. There is another of the Ascomycetes that we saw several times, but later in the season. It is named *Cordyceps militaris.* It looks like a *Clavaria,* but one can see with the help of a hand lens, the orange-colored perethecia imbedded in the club shaped head.

Cordyceps is a genus that becomes parasitic either on insects or on some subterranean fungi. It often grows on moths, buried beneath dead leaves, the club rising above the surface. It may sometimes be seen in conidial stage and looks like a small white plume. Not far from the grassy place where I found the little

Coprinus, stretched a shady road, passing through dense woods. One side of it was bordered by a high clay bank, on the other the ground descended steeply to a little brook, and on both sides grew a tangled mass of rhododendrons. Through the month of July the great laurels reigned supreme and little could be seen but the gorgeous flowers, but in August the clay bank turned out to be a treasure house of fungi. The pretty Peziza, *Lachnea macropus,* grew in numbers. Underwood has a drawing of it (Plate No. IV. page 230) in his books on "Moulds, Mildews and Mushrooms;" but it gives no adequate idea of the grace and beauty of the plant. It is shaped like a delicate goblet of a grey color. Some of them were nearly three inches high and the caps measured one and one-half inches in width. Prof. Atkinson mentions two species of *Sarcoscpyha.* This is also a peziza, a sub-genus of *Lachnea.* I did not find at Pocono the species he describes, but another one named *Sarcoscypha occidentalis,* which I sent to Mr. Ellis for identification. It grew in the center of a clump of moss and could not have measured more than a line in breadth. It had a slender stipe, which was white and smooth, in strong contrast to the bright scarlet cup. It must be a much smaller species than those that Atkinson mentioned and it grew later in the season.

I found one species of *Guepinia.* It resembled tiny pinkish clubs, peeping through the chinks of a piece of dead wood. This genus belongs to the Tremellineae and the plants are gelatinous in their nature.

The mushrooms I have described, form but a small part of the many I found at Mt. Pocono last summer. There is no room in this paper even to mention by name the various species of *Russula, Lactarius, Hygrophorus, Mycena* and *Collybia,* or any of the more familiar Agarics. I leave to the last our most interesting discovery. We saw a mushroom growing on an old dead log, very different in appearance from all we had hitherto seen. The color was grey, the shape was disc-like, the stem short and slender and the hymenium almost smooth. It was plainly not an Agaric. I sent it to Mr. J. B. Ellis and he pronounced it a new species of *Ciboria,* a subgenus of Peziza. The plants grew on dead wood. Mr. Ellis asked me to procure some more specimens

which I did with difficulty, as they were extremely rare. These confirmed his opinion as to its being a new species and he will publish it under the name of *Ciboria Dallasina* E. and E.

Philadelphia, Pa.

NOTE AND COMMENT.

The Dwarf Blue Curls.—In connection with Mr. Terry's valuable article in this issue, the editor would note that the dwarf blue curls (*Prunella vulgaris nana*) in his grounds appears to bloom as freely as the large plants of roadsides and ditches. With us it roots at nearly every joint and is thus able to spread with great rapidity.

Onions as a Rival to the Aneroid.--In some country households there are to be seen at the present time twelve large onions placed in a row, with a pinch of salt on the top of each. What mission have these odoriferous roots to perform? They are there, the *Agricultural World* explains, as weather prophets. The onions were set in position on Christmas Day. They will be kept on guard until Twelfth Night. Then the believer in their prophetic office will examine them with scrupulous care. On some onions the salt will have melted; on others it will have remained dry. Each onion represents a month. A rainy month is indicated when the salt has melted, and a dry month when it has kept intact.

A New Local Botanical Club.—The constitution of the American Botanical club provides that when there are five members in one locality these may form a local branch which is to be given a number and the name of some flower, the latter chosen by the branch itself. Acting upon this, Mr. H. S. Clark has secured for Connecticut the honor of possessing the first branch by establishing at Hartford, Erodium Branch No. 1. Mr. Clark has been elected president and Miss K. A. Bartholomew, secretary. The meetings will be held on the first Monday evening in each month. By forming a local club such as this students of plants can gain many new ideas that might not come to them working alone and the example of Erodium Branch is recommended to others. The branch receives its name from the fact that the president recently found the first *Erodium moschatum* reported from Connecticut.

EDITORIAL.

The present year seems to have been a hard one for botanical publications. In addition to *Meehan's Monthly,* the *Junior Naturalist* and *California Floriculturist* have given up the ghost. While the subjects to which these journals are devoted make them in a certain sense rivals of THE AMERICAN BOTANIST we take no pleasure in the passing of the least of them, for each suspension is but another proof that in botanical fields the battles are sharp and the rewards few. A successful botanical publication is likely, for some time to come, to be catalogued with the rarest of rare species.

Although there are still in existence a dozen or more publications devoted to botany in its best sense, the latest reports of the newspaper directories do not credit a single one of them with a circulation of as many as a thousand copies. This is truly a poor showing for publications devoted to a science that is taught in nearly every High School in the land. One subscriber for every hundred thousand of population! Is it at all surprising that an editor after doing his best for years to advance his chosen science should finally become disgusted at the small interest displayed and draw out of the race? Another thing that adds to the botanical editor's chagrin is the fact that some of the horticultural and floricultural publications have most astonishing circulations. One magazine, in particular, issues more than three hundred and fifty thousand copies each month. If botanical journals were half as well supported the science would advance much faster than it does at present.

The reader may ask how he is concerned in all this. At first glance, the matter may seem to be one in which editors and publishers alone are interested; but it can readily be shown that it is of vital importance to every person interested in botany. A botanical journal that is not properly supported, will sooner or later be obliged to suspend, leaving the field to less worthy publications if it is occupied at all. No one doubts that the botanical publication is of great value to the science; it gives in a single year more specialized information than can be obtained elsewhere for many

times its price. Therefore, it behooves every botanist and botanizer to stand by any that are worthy, supporting them not only by subscribing, but by speaking of them to others, by contributing to their pages and in various other ways helping toward their advancement. An attractive botanical publication is as much a credit to its subscribers and contributors as it is to the one who edits it or the country in which it is published.

Although the past has held very little of encouragement for the botanical publication the prospects for the furture are much better. The large number of nature books that have been issued in the past decade, are slowly but surely increasing the number of those who take an intelligent interest in plant and animal life. Some of these books have sold from twenty-five thousand to one hundred thousand copies each--figures which the average novel fails to reach in spite of the phenomenal sales of a few of the leaders. In the light of these facts it is not too much to expect that the next few years will develop botanical magazines of from thirty two to sixty-four pages, with subscribers enough to make their publication worth while. But such magazines will not develop unless properly supported.

The gentle art of scientific criticism has received a new interpretation from a recent reviewer of a paper on the birches by Mr. M. L. Fernald. The critic, finding nothing wrong with the facts, still unwilling to agree with the author, pitches into his diction. Criticism of this kind, however, comes with bad grace from a critic who is author of that famous phrase "birds and animals." If birds are not animals, what are they?

Referring to the note in a recent number of this magazine regarding the color of the berries of the false Solomon's seal or wild spikenard (*Smilicina racemosa*) a correspondent writes: "For three successive late autumns I have made note of the fact that these berries lose their spots and become clear red when fully ripe and yet I did not dare say so." If plant-lovers generally knew how much is guessed at in the making of even our best manuals, they would doubtless study the plants in the field with greater diligence. It is no secret that the text books are founded

on dried specimens. Many of our most distinguished scientists rarely go afield for study. Anyone who has noted the difference between the dead and flattened mummy of a plant and its living counterpart can readily realize that the closet student may become so familiar with the dried specimens as to scarcely recognize recently gathered material. It is told of a prominent New England botanist that when he found it difficult to identify a living plant, he used to say, "Well, let's dry it and then see how it looks." And fern students assert that a certain prominent authority at Kew refused to name ferns submitted to him unless they were first dried! Students of plants, therefore, should not too easily become convinced that their observations are wrong. Possibly the book is at fault. And in any case when book and student do not agree, it is well to make a note of the difference and get the opinion of others about it.

Dr. Adolf Wagner of Innsbruck, Austria, announces that beginning with January, 1903, he will issue a bi-weekly publication devoted to abstracts of original botanical articles, such abstracts to be furnished by the authors. No charge is to be made for publishing the abstracts. The first year's subscription has been fixed at 28 kroners.

With the increase in the interest in natural history has come the desire to grow and study plants from other localities. Among those who are catering to this want, a prominent place must be given to Mrs. S. B. Walker of Sedalia, Colorado and Harlan P. Kelsey, Kawana, N. C. Mrs. Walker's specialty is seed of Colorado wild flowers. The editor has had considerable pleasure the past summer in watching the development of plants from some of this seed. Mr. Kelsey's specialty is hardy native plants and the catalogue that describes them is so finely illustrated, that it is worth preserving with other botanical literature. His nurseries at Kawana are in charge of a member of the American Botanical club. Mrs. Walker also issues a catalogue. A copy of either catalogue may be had for the asking.

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CONCERNING THE APPLE.

BY CHAS. D. TURNBALL.

It seems that when a writer on nature desires to attest and confirm his title and demonstrate his ability to interpret nature's moods and signs he naturally employs the apple in his effort. Thoreau's essay on the apple has never been equalled for fullness and understanding, John Burroughs has also written entertainingly on the subject, and every writer appears to consider it an appropriate subject and a proper one with which to further his claim to consideration. The reason for this is plain. The apple is so thoroughly individual in the wood; the ash superficially resembles the maple, the chestnut resembles the oak,--in truth all have many points of similiarity; but which could be confounded with the apple, even by one unacquainted with out-of-doors lore? On the tree-clad mountain-side it attracts our gaze as surely as the majesty of the oak or the stateliness of the chestnut. Since the course of empire began its journey towards the setting sun, the apple tree, like the cow and horse, has followed in its wake, and in the course of ages has acquired an appearance of domestication. This way explains how, though ungainly and illfavored, in comparison with the beauty of the elm or maple, it is admired by all with whom out-of-door nature finds favor.

It is one of the few trees of temperate latitudes that are practially never found in an absolutely wild state. Those hardy trees on the hills are not wild. From cores carelessly tossed here and there by America's first farmers and with the aid of the cows and birds it left the bounds of civilization and began life in the wilds. But it will be noted that only the hardy kinds, the Russian varities, have ever evinced a desire to run wild. Our summer apples, the Astrachan and Golden Sweet, from southern Asia, are quite content to grow under man's protection.

In the early times of towns in the old states every goodman surrounded his gabelled domicile with an apple orchard and in the cool of evening he strolled through the dark lanes of trees. But the increase of the town in after years, cut his orchard, like Wolfert Webber's cabbage patch, into snug building lots, and though many trees were felled to make way for streets and houses numbers remained, and to this day the goodman's orchard may be seen in the tottering, age-blasted trees in the yards of old houses in the ancient parts of the city, some bearing fruit, of varieties that long since disappeared, though without doubt we might find some of their venerable brothers in sleepy, mouldering English hamlets.

The old age of the wild apple is pathetic. Often we see their dried, lichen-covered skeletons in the meadows and on the hills, and in the forest clearing is a poor-looking, stagheaded tree that vainly strives to cover its blasted limbs. For these many years they have responded to vernal warmth with coats of white and pink; the glory of June days and the breath of brown October contributed to the many yields of unmarked fruit, unmarked, but by the squirrel or browsing cow, or such as myself, who tramp the hills. The robin and blue-bird nested in the crooked limbs, and while the warm spring sun shone above, they taught their callow young. But wintry storms of rain and biting wind have corrupted and torn the aged limbs and a few seasons will lay them on the sward.

Hartford, Conn.

FRINGED GENTIAN.

By Wm. A. Terry.

I was pleased to see the account of experiments with the fringed gentian by Mr. Chas. C. Plitt in the October Botanist. I think there is no doubt that the plant is a biennial in this section. My edition of Gray says: "Annual or biennial," and all my observations and experiments have convinced me that here it is biennial. It is growing more rare every year, and I fear that all efforts to prevent its extermination will fail. It is difficult to propagate. Some twenty or more years ago a well known Scotch gardener of Hartford offered a prize for plants artificially grown from seed.

It grows best in wet meadows and frequently in bushy swamps and swampy pastures and often in moist places by the roadside. In the meadows it is almost certain to be cut down with the late grasses, before maturing its seed, by the roadside it is equally certain to be gathered in flower. But, beside these dangers, it has another enemy more destructive than all others. Several years ago I found nearly a hundred of these plants in flower by the side of an unfrequented road. I gathered all those that were conspicuous, hoping that the others would escape observation. Later I visited them again, and found the seedpods matured and gathered some hundreds of them. On examination not one in twenty of these contained any seed. The others were inhabited by a small, light colored larva that had devoured most of the seed, and was rapidly consuming the rest. In December of the same year, I was exploring a woodland some five miles away from the place where these seeds were gathered, and found a number of dried plants still holding their seedpods upright. On examination these were found to contain from one to three of similar larva in each pod, much larger and darker in color than those found in the fall. They had consumed every seed and were evidently hibernating for the winter.

The seed we had collected were carefully planted. Some immediately after gathering, and some in the following spring. They were planted in the window garden, in the green house, in the flower garden and in the fields. Some that my wife planted in the window garden came up, and she had two or three dozen plants. These were potted up as they became large enough and some of them were planted out in the spring. They were slender and slowgrowing plants, very sensitive to injuries, and all of them died at various periods before reaching maturity. None of the other seeds planted at various times and in various places ever came up.

Another of our wild flowers the mountain fringe (*Adlumia fungosa*) is generally called a biennial. Three years ago I took a young plant from the mountain, and set it out back of my woodhouse; it grew luxuriantly and covered the roof with vines loaded with flowers, which ripened an abundance of its black, shiny seeds The next year to my surprise none of them came up, but this year

they sprouted in quantities, making numerous stout, healthy plants, which are now in condition to make flowering plants next season, thus taking three years to flower from seed. Another wild flower in danger of extinction here is the painted cup (*Castillcia coccinea*). It used to grow in wet meadows in such abundance that the school children called it "headache plant," claiming that it gave them the headache to go through it. I well remember as a child that a bunch of it held before the face was so dazzling to the eyes as to blur the outlines. I have sometimes seen patches of it in which the floral bracts were tipped with bright yellow instead of scarlet. For several years this plant has been very scarce here.

Another fact I have observed, I would like explained. If the flowers of some perennials are picked, the plants disappear. I have known this to happen with the orchid, *Colopogon pulchellus* and some others. Several years ago a field half a mile from my house was full of flowers of *Chamaelirium luteum*. Some ladies picked them all to decorate a church, and since that time not a flower of this plant has ever been found in that field or its neighborhood, as far as I can discover.

Bristol, Conn.

THE PHYSICIAN'S NEED OF BOTANY.

By Prof. W. W. Bailey.

It will be at once conceded that it strengthens any operator, artist, or artisan to have an intimate acquaintance with the tools of his profession and it would seem that a certain knowledge of botany while not perhaps essential, would be very desirable to the physician. The history of the two sciences is coetaneous.

Yet many physicians are confessedly ignorant of botany, and will assure you, from the fact that they have succeeded without it, that it has no practical value to the doctor. I confess that this argument is hard to meet, nor would I attempt to face it if it were not for the fact that just as learned physicians contend for it and some of the Medical schools expect it.

That many physicians have considered botany important, is proved by the numberless recruits we have had from their ranks. Some of the greatest lights of botanical science have been physi-

cians. We have but to look to our own country to find the names of Torrey, Gray, Engelmann and Goodale. All these men started as doctors and, for one cause or another, drifted into the sister science. Army and Navy surgeons not a few, as a relief perhaps to the tedium of garrison or ship duty, have taken to botany or kindred science. Note such names of Elliott Coues and Valery Havard.

Granted that botany is of use to the physician, on what grounds do we base the claim? One strong reason for at least a rudimentary knowledge, is that one can here best study the organic cell in its simpler and afterwards in its more complex combination. Essential microscopic technique is at the same time acquired. Then again, all about us, in air and water, in our food, *everywhere* in fact, prevail microscopic organisms, many of them potent and insidious causes of disease. I have only to point out that bacteria are plants, to show how important it is to know something of their structure and life history.

I sometimes fancy that when a physician remarks that botany is of no use, he is thinking of the old style botany, mere analysis, so-called. If our study led only to the dry facts of systematic arrangement, non-vitalized by the story of the plant's life and relations, I should vote with him in regard to the waste of time spent in the pursuit. Nowadays we hope to have reformed this altogether.

The student learns to recognize certain medicinal plants, their affinities, properties and derivatives. He learns also from mental deduction to expect certain qualities for good or evil in definite groups or orders of plants, and knowing these tendencies or fixed characters, ever looks for them when these plants occur.

Thus in *Papaveraceal* he expects norcotics akin to opium; in *Solanaceae* such alkaloids as atropine or nicotine, daturine, or hyoscyamine; in *Umbelliferae* acute poisons, like conium, aethusa and cicuta, drugs like assafoetida; in *Euphorbiaceae* irritants or purgatives, like croton or castor oil.

On the other hand he is assured that *Malvaceae* will yield him only harmless, soothing mucilages and the *Labiatae,* perfumes essential oils, balms and stimulants. He can thus, in a strange country, apart from societies, libraries and collections, build up a

local pharmacopeia, making substitutes of indigenous plants for those known at home.

By careful botanical study, he not only learns to systematize and generalize--useful pursuits both, when infused with life--but also to detect adulterations and frauds, to hate quackery and pseudo-science, and to foster only what is experimentally proved to be useful, or by logical inference presumed to be so. Apart from immediate and tangible results, the incidental training in observation, comparison, diagnosis, must inevitably redound to one's mental advantage.

The study of medicine is almost coeval with the origin of the human race. With man came woe and the desire to relieve it. Says Cabanis: "As man cannot exclude himself entirely from the constant agency of many external causes; and as he carries with him several others which are destined to act at particular periods of life, or which may at any time exert their influence; we may with safety affirm that the first trials of particular remedies bear almost as ancient a date as the existence of man himself. Among the most rude and uncultured tribes,as those of New Holland and New Zealand, of Lapland and Greenland, of North America and tne interior of Africa, we find traces of the practice of medicine and surgery."

HOW INDIA RUBBER IS OBTAINED.

The true "Para," India rubber (*Hevia*) is to be found growing naturally within the immense forest-covered area of the valley of the Amazon and in the tributary rivers, including the head streams of the Orinoco. I found it abundant high up on the Orinoco, above the junction of the Guaviare (the latter stream by right indeed, should be styled the head stream of the Orinoco). It is plentiful on the banks of the Cassiquiare--that curious bifurcation by which the Orinoco gives a stream to the Rio Negro, and so converts Guayana into an immense island. I also found it growing in the interior betwixt the Tapajos and the Xingu. The rivers from which the largest supply is drawn now by traders are the Purus and the Maderia. In its native forests it grows dispersed among the other forest trees, two or three trees rarely be-

ing found in juxtaposition. In appearance the *Hevia* is a handsome tree, with straight cylindrical trunk--differing wholly from the Ule—the India rubber tree (*Castilloa*) seen in Moskito and Nicaragua to South Mexico. The wood is soft and perishable. The bark as in the great majority of tropical trees, is not very thick, and is of a gray color on the surface, but when scraped, approaches the appearance and color of a light bay horse's coat. This cleaning has to be done, as in moister regions the bark is thickly coated with growths of moss, ferns and orchids. The seeds grow, three together, in a sort of hard pod. This pod, becoming heated by the sun bursts when it is ripe with a sharp popping sound and scatters the seed for a considerable distance around the tree. The seed is exceedingly oily, and the oil extracted therefrom, closely resembling linseed oil, is a valuable product. The range of temperature in the *Hevia* forest is between 70 deg., and 90 deg., throughout the year. Rainfall varies considerably in different districts where *Hevia* is found, some districts being nicely divided into wet and dry seasons, each of about six months' duration, while in others it rains more or less the year round. In such districts it is more difficult to collect the *caoutchouc* profitably, as if the stem of the tree is very wet when it is worked, the *latex*, or rubber-milk, spreads over the surface, of the bark, and is in large part lost. From what has been said it may be seen that the main part of the India rubber must be collected during the dry season, although "siringaros." who live near "ciringals," or rubber walks, improve their opportunity by tapping their trees whenever fine days occur during the rainy season. But the trees are doubtless better for a half yearly rest.

When the native hunter has discovered for himself a district of the forest in which "siringa" trees are sufficiently numerous and near together he first connects them together by cutting a "picado" or path, with his bush knife. Having thus discovered their relative bearing, he next straightens and clears out his paths, endeavoring at the same time to take in as many trees as possible on each path, and to make all the paths converge to a certain spot, where he puts up his "barrica"or curing station. This done, and having collected a supply of the old nuts of the *inaja* (*Maximili-*

ana regia) or similar oily palm nuts, he is ready to commence operations on the first fine day. There is some diversity in the manner of taking the rubber *latex* in the Amazon valley. In some districts they prepare long strips from the inner pith of the footstalk of the leaf of the *inaja* or of the *bacaba* palm. These are tacked obliquely round the stem of the trees, with sharpened pieces split out of hard covering of the same leaf stalks. These strips, being smeared on the inside with wet clay, form a channel for collecting and conducting the *latex* milk into the cup placed to receive it. In the other method, which I consider the better, the cups are put on in a ring round the trunk, usually a span apart. Three cuts about 1 1-2 ins. long are made in the bark with a small axe. In this way the number of cups is proportioned to the size of the tree. Tin cups are used. They are made slightly concave on one side in order to fit the convexity of the tree trunks. They are attached to the tree by the use of a piece of the ball of kneaded clay, which each collector carries in his bag. The tapping always begins as soon as there is light enough in the forest path to see by. One man is usually apportioned to each path, containing, say, 100 trees. When he has tapped his trees, he sits down at the end of the path for half an hour or so, but as soon as he sees that the tree last tapped has ceased to drip the milk, he starts at a trot on the back track, detaching and emptying the cups into his calabash as quickly as possible. Speed throughout is a great object, as the milk *latex* speedily coagulates, and then can only be sold on the market for an inferior price, as *sernambi,* as compared to that obtained for that which has been smoke-cured. When the men arrive at the central hut from their different converging paths they each empty their quantum of the *latex* taken for the morning's work into one of the large Indian native earthenware pans, usually used as a receptacle. Care is taken to squeeze out with the hands all of the already coagulated curd-like masses. These are thrown on one side to be made up into balls. Earthen pots in form of miniature kilns are placed over small fires, and the "siringero" sits down to the really tedious part of his business. He drops a handful or so of the oily palm nuts down the narrow neck of the kiln, and forthwith arises a dense smoke. Taking a wooden mould--

like an ace of spades in form--and holding it over the pan, he pours some of the *latex* over it in a thin film keeping it turned, so that it shall not run off before he succeeds in setting it to an even surface, which it soon does as it is passed backward and forward through the column of smoke. This is continued, one coating after another, until he has finished the day's supply of rubber-milk. He then sticks his mould up in the thatch of the roof of the shed for the repetition of the process next day, and until he finds the thickness of the *biscuit* makes the mould unwieldy to handle, when it is cut down one side, slipped off, and stored.--*Indian Gardening.*

A NEW WAY TO OBTAIN SPORELINGS.

The gardener of a hotel in Florida noticed numerous little plants of Maiden-hair fern (*Adiantum capillus- veneris*) clinging to the side of a large pot containing an old plant. On examination he saw that the spores had fallen and germinated in the congenial warm, moist situation. He was fond of experimenting with ferns and prepared a large pan in which he put several bricks of the common building sort, and filled the pan about half full of water, coming about half way up the bricks. When they were thoroughly saturated he shook the spores of certain ferns upon them and awaited results. In this way he raised many ferns, though having sometimes to wait months for their full development. On inquiry I found that the most interesting feature of the plan to him was the variation he found in the young plants from their progenitors.--*Mrs. E. C. Anthony in Fern Bulletin.*

CLIMATE AND VEGETATION.

Physical geographies have heretofore paid some attention to the question of plant and life zones, but it has been usually very superficial, consisting of an elementary discussion of the climatic conditions associated with certain well known and easily distinguished plants. Thus Houghton says: "Plants require for their growth certain conditions of light, heat and moisture, and since the requisite amount of each of these varies with different species of plants, we find in every climatic zone a characteristic flora. * * * Moisture and heat are the prime essentials of vegeta-

tion, and it is on their distribution that the distribution of vegetation is principally dependent. The influence of heat and moisture is noticed as we pass from the equator to the poles, or from the base of a tropical mountain to its summit, thus arises a horizontal and a vertical distribution of vegetation."

The horizontal zones of vegetation have heretofore been designated the tropical, subtropical, warm temperate, cold temperate, subarctic, and arctic, each with its distinguishing climate and vegetation, although overlapping each other somewhat. The Biological Survey, however, has given a different division, calling the three life zones of North America the tropical, austral, and boreal, subdividing these into the tropical, lower austral, upper austral, transition, Canadian, Hudsonian, and arctic--seven in all. The tropical is indicated by the region in the extreme southland, including the southern parts of Florida, Central America, the lowlands of Mexico, and the lower Gulf region; the austral covers the whole of the United States and Mexico, except along the extreme north and south, while the boreal covers the entire northern part of the continent to the polar regions, and also a few peaks of the higher mountain systems within the United States.

Subdivided and considered for temperature, the survey finds that the tropical zone is confined within that area which has a total quantity of heat approximating at least 26,000 degrees F. This is obtained by considering 43 degrees as the beginning of plant activity. With 43 degrees as a beginning, the effective temperature or degrees of heat (daily mean normal shade temperatures) in excess of this number were added together for the several stations considered in the different zones, beginning when the normal means in spring exceeded 43 degrees and continuing until it fell to or below that point in the fall. With this as a basis the tropical was found to lie within lines which were bounded by an annual quantity of at least 26,000 degrees. The lower austral was confined to a region which required a total quantity of at least 18,000 degrees F. The upper austral to a region and to plant species which required at least 11,500 degrees F. The plants of this zone apparently can not endure daily a summer temperature during six consecutive weeks of 79.8 degrees. The transition was confined

to a region which required at least 10,000 degrees, the plants of which were apparently unable to withstand six consecutive weeks of daily summer temperature averaging 71.6 degrees, and the Canadian, Hudsonian, and arctic extending thence northward into the polar region, their southern limits being marked by the isotherms for the six consecutive hottest weeks of 64.4 degrees, 57.2 degrees and 50 degrees, respectively. The conclusion of the survey in regard to the distribution of plants and animals is as follows: "The northward distribution of terrestial animals and plants is governed by the sum of the positive temperatures for the entire season of growth and reproduction, and the southward distribution is governed by the mean temperature of a brief period during the hottest part of the year."

Vegetation throughout the greater part of the United States lies within the temperate (or austral) zone, and is dormant during several months of the year. It is within this region, however, that our largest staple food crops are produced. Germination and growth are wholly dependent upon the temperature in excess or deficiency of 43 degrees. Adamson says that "the development of buds is determined by the sum of the daily temperatures counted from the beginning of the year." But it is likely that a more accurate expression would be the sum of the daily temperatures from the cessation of winter.

The adaptability of plants to climate is so great that it is questionable if the heat units obtained for one latitude would be those required in a more northerly or southerly latitude. Take wheat, for instance; it can be grown successfully within the semitropical zone and thence northward beyond the cold temperate zone, a range of probably 20 to 25 degrees of latitude, and in the northern limit the rate of growth is the more rapid. Hoffman, in a series of experiments at Giessen, Germany and Upsala, Sweden, found that the time of the blooming of the Syringa vulgaris (common lilac) was April 29 at Giessen and June 17 at Upsala. The heat units received were 1,482 degrees and 1,433 degrees C., respectively, practically the same. In the first ripening of fruits, 11 species being considered, the ratio between the two places was as 100 to 82, while for the interval between the first bloom and the ripening

of fruits the ratio was as 100 to 93. It is commonly observed, often to the great loss of the farmer, that seeds from plants brought into a northern country from the south produce plants which will not mature, for they are caught by the early frosts, while, vice versa, the northern plants in the south ripen far earlier than the native species. Thus it behooves the seeker after seed to stay as nearly as possible within his line of climatic latitude, or draw from a region slightly to the northward.

It has been found that the average daily temperature in the shade must be above 39.2 degrees F., for sugar cane, and 46.4 degrees F., for potatoes, if one desires to observe the effects of germination and growth. And the higher the temperature the quicker the germination and growth. Huberlandt found that with a temperature of 49.0 degrees it took beet seed twenty-two days to germinate, while with a temperature of 60.4 degrees only three and three-fourths days were necessary. With these plants, also, the maximum yields were secured by planting the 1st of May rather than the 1st of March or April.

Rainfall is, next to temperature, the most important climatic element. The amount required for the growth of vegetation has been ascertained many times and for a large variety of plants, but with rainfall, as with temperature, there seems to be a wide range, possibly because plants adapt themselves to their environment. In addition to the amount of rainfall required, it is essential also to know the frequency of fall, the rapidity of fall, and the average amount of each fall. Thus a rainfall of 4 to 5 inches per month would, if it came in showers of a half to three-quarters of an inch, provide ample moisture for the most thirsty farm crop, but if the same amount were dashed down in one or two heavy showers, the result would not be favorable. Other points of value are the probability of rainfall, the length of time rain may reasonably be expected to continue after it has set in, the extent of the country covered, the temperature, humidity, sunshine and wind before and following the rain, the condition of the ground water, drainage, and composition of the soil, and the moisture characteristics of the plant.

Sunshine as a factor in plant growth is probably third in im-

portance, and closely allied to temperature. It is usually determined by the inverse method, observations of clouds and cloudiness, rather than the actual sunshine, although of late years many of our stations are equipped with sunshine recorders, and the approximate hours of sunshine are obtained with a fair degree of accuracy.

The effect of sunshine in determining the form of plants is well known. If a plant germinate beneath a box, board, or stone it does not spread out at random, but takes the shortest path to the sunlight, where it spreads out in its usual form. The form and direction of growth of every branch, leaf, or shoot of a plant is controlled largely by its accessibility to the light. This is true even to the development of the branches, for these bud and grow where the leaves can unfold to the light with the least obstruction, and a symmetrical plant is usually an unobstructed one.

Just how much sunshine is essential has not been fully determined, so far as I can learn, but that plants differ much in their requirement, and also adapt themselves rapidly in this, as in temperature and moisture, is well known. An almost cloudless sky for months will not harm many plants if they have an abundance of moisture, and it is probable that others would be equally immune if they were gradually acclimated. Experiments in Paris carried on through a period of five years, in which sunshine, heat, rainfall, and evaporation were carefully measured from March to July, inclusive, showed that a considerable increase in crop yield was obtained when the percentage of sunshine was greatest, although at no time during the period was there a very marked difference in the amount of sunshine measured.

Other climatic elements which can be considered of value in relation to vegetation are wind direction, wind velocity, and evaporation. The wind direction and velocity of all parts of the United States have been determined with reasonable accuracy, and should be available to anyone seeking this information. The damaging effects of high winds can be largely controlled by the cultivation of wind-breaks. These will quickly and permaently prevent drifting of the soil, too rapid evaporation by high winds, broken and fallen grain, due to the same cause, and, to a consider-

able extent, winter killing. Professor King finds a marked decrease in the rate of evaporation for a considerable distance to the leeward of a row of trees or a hedge. He also recommends for a windy country, where light and comparatively porous soils predominate, small, narrow fields, with intervening fields of clover, alfalfa, or grass, for even these small plants serve as marked barrier in drifting soils.---*Chas. E. Linney, in Proceedings of Second Convention of Weather Bureau officials.*

NOTE AND COMMENT.

Change of Odor in Jasmin Flowers.—It has been noticed by those who grow the common jasmin that the flowers when first expanded, possess in a marked degree the delicious fresh odor which is characteristic of them. But as flowering progresses, the perfume becomes less delicate and the blooms are then very attractive to blue-bottle flies. This would appear to have some connection with the recorded formation of indol in the jasmin bloom as the process of flowering approaches completion.--*Scientific American.*

The Fringed Gentian a Biennial.—Mr. Plitt who contributed an interesting article to the October *Botanist* will find his expectations result as he anticipates. More than ten years ago, Mr. George Redles contributed to the Germantown Horticultural Society, the knowledge of the biennial habit of the fringed gentian and both he and myself have possessed a "rare locality" in the "Wissahickon woods"— a noted locality here—by collecting seed and planting with judgment. Seeds planted one year develop the next, the plants blooming the second year. There has been no variation from this and we have followed this course for so many seasons with unvarying results that with us, the biennial character is beyond a doubt.—*Edwin C. Jellett, Germantown, Pa.*

A Mix-up in Common Names.—An amusing instance of the misunderstandings that may arise when only the common names of plants are used, and one that well teaches the value of a stable nomenclature, is furnished by two horticultural contemporaries. Some one sent the editor of the *Florist's Exchange* a box of papaw fruits (*Asimina triloba*) and asked if the difference in the

amount of fruit borne by different trees was not due to imperfect or unisexual flowers. Upon his replying in the affimative the editor of *Indian Gardening* observes that they do not know every thing down in Ohio and that the papaw tree (which this time is (*Carica papaya*) bears the two kinds of flowers on separate trees. Each editor had a different tree in mind, but one common name characterized both.

How the Choke-Berry Increases.—The tangled thickets of choke-berry (*Pyrus melanocarpa*) are conspicuous features of many swampy tracts, but only in a general way is it known how such thickets are formed. If one will take the trouble to dig up a specimen he will find that many of the roots, after running for some distance in the soil turn abruptly upward and form new stems. An old shrub with all its dependent progeny around it is a curious sight when uprooted. Its manner of life is exactly the reverse of the famous banyan tree whose branches produce roots. The choke-berry's method is only a variation of the penchant for producing suckers from the roots that is common to many of its nearest of kin. Some varities of the cultivated plum sucker so freely that they are not to be tolerated on a well kept lawn. The wil ' crab also has the habit. Let but a single plant alone and it will produce a thicket in short order—a vast green pyramid, the tallest and oldest plants in the center, and grading down to the tender yearlings on the edges.

Albino Flowers.—When the slightest difference is noted and varying departures from original types are seized upon to enhance the reputation of their discoverers, why is it that the white variety of the chickory (*Cichorium intybus*) and the white variety of the moth mullein (*Verbascum blattaria*) are not distinctly named? Both these varieties are constant and in some localities are almost as plentiful as the standard types. Prof. Gray, many years ago gave a reason, but when less important variations in other classes of plants are recorded, it to me seems strange that differences so pronounced are passed.—*Edwin C. Jellett, Germantown, Pa.* [Most botanists look upon white flowers as albinos and the circumstances which produce them as analogous to those which cause albinism in animals. Less notice would there-

fore be taken of a white-flowered form of a species that normally produces colored flowers than if the flowers varied to some other color. Albino flowers are always of interest and the finding of such on species not before known to produce them should be recorded.—Ed.]

Origin of Nectaries.—The nectar is produced in the flower for the bees in order to secure a transfer of pollen—so we are told,—but how about the nectaries on other parts of the plant? Many plants have honey-glands at the base of the leaves and even the ferns, which never bear flowers and therefore have no pollen to carry, often have these glands. The common bracken (*Pteris aquilina*) is a conspicuous example. The truth is that our interpretation of each fact in plant-life as an adaptation of the plant looking toward its active advancement is probably erroneous. In the case of honey-glands on the leaf-stem it has been found that most, if not all of them, are merely excreting organs. The plant takes its crude materials from the water and air and in the chemical reaction necessary to form the material for its own use, certain other undesirable products are thrown off and these the plant promptly gets rid of by emptying them through the glands, If these excreted products happen to please the tastes of ant or fly it is so much their gain. The bracken has honey-glands at the base of each pinnule; but the male fern (*Nephrodium filix-mas*) of Europe and the marginal shield fern (*Nephrodium marginale*) of America, as if to show conclusively that the attraction of insects is not their real object, have similar glands in their root-stocks which empty inwardly into certain vacant spaces formed by the breaking down of several old cells. To return to the flower, it is probable that the nectaries were not evolved entirely with an eye to the bee; but that given a primitive honey-gland and an insect with a taste for sweets, bee and nectary have developed together.

An American Plant Craze.—The craze for tulips that raged in Holland some three hundred years ago, is a matter of common knowledge. While it was at its height, two thousand dollars was frequently paid for a single bulb. That this mania had a parallel in America seems scarcely known. According to *The*

Scientific American, James I. of England who hated tobacco and was resolved to replace its culture in Virginia by the rearing of silk worms may be said to have started the mischief, but it was not until the Chinese mulberry (*Morus multicaulis*) began to be advocated as a food for the silk-worm that it assumed its alarming proportions. Silk-worms were raised in considerable numbers in Virginia and the coronation robe of Charles II. was made from such silk. In 1759, 10,000 pounds of raw silk was exported from Georgia. At first the worms were fed on the leaves of the white mulberry (*Morus alba*) but as soon as the qualities of the Chinese mulberry became known, a speculative fever seized upon all classes. It raged with particular virulence in Connecticut. Everybody expected to get rich in growing mulberry trees. At first these sold for three to five dollars a hundred, but the price rapidly advanced to five dollars each, and single trees were sold for as high as one hundred dollars. Cuttings were available for planting and slender switches, two feet long were sold for twenty-five dollars a dozen. The trees upon ten acres of land brought $38,000. So interested were the people in raising trees that the rearing of silk-worms was nearly forgotten. When the crash came many who had invested in the business were totally ruined. In the reaction that ensued the trees were pulled up and burned and in 1844 a violent storm followed by a general blight finished the mulberries and thus ended the culture of silk in America.

Tortoises and Toadstools.--It seems that man is not the only animal with a taste for the higher fungi. Dr. Harshberger in the October *Journal of Mycology* notes that the box tortoise (*Cistudo Virginica*) is very fond of the green russula (*R. virescens*) a toadstool not uncommon in America.

Fruit of Yew not Poisonous.--In the September number, you ask if the fruit of the ground hemlock (*Taxus canadensis*) is poisonous. I would say that I know of at least six persons, including myself, who have eaten of the fruit without ill effects. One person says that she has even eaten a small handful at a time. The Century Dictionary says that the leaves of the yew are poisonous, but makes no mention of the fruit.--*Kate Harrison, Wellsboro, Pa.*

EDITORIAL.

It was formerly supposed that the newspapers had the exclusive right to publish startling and unfounded stories about plants, but of late the horticultural and floricultural publications seem inclined to enroach upon this field. That tropical weed the *Bryophyllum* a species allied to our common live-forever (*Sedum*) and often the base of amazing stories in the past, is again to the front in a paragraph to the effect that it is impossible to kill it. "You may chop it up into bits," says the article "and every piece will produce a new plant." The simple fact is that the leaves of the *Bryophyllum,* like those of the live-for-ever are rather tenacious of life and if they come in contact with moist soil even after severed from the plant, will produce new plantlets from buds on their margins. Another horticultural magazine gravely informs its readers that the grape-fruit (*Citrus decumana*) receives its common name from the fact that it grows "in grapose clusters." Everybody that has seen the grape-fruit growing knows that the fruits hang singly, like their near relatives the orange and lemon. "Grapose clusters" savors strongly of facts manufactured to fit the explanation.

In an article on walking sticks that orginiated in a magazine devoted to floriculture and has since been widely circulated, we are told that most walking sticks come from abroad and are towed to this country by various vessels in order that the salt water may harden them in transit. Without knowing positively that a bundle of walking sticks has never been dragged across the Atlantic in the wake of a steamer, the editor ventures the opinion that most skippers would prefer such cargoes inside their vessels and would even prefer to salt them, if need be, rather than have them flopping along behind.

These stories are harmless though absurd, but of a different nature is a recent article to the effect that every fruit carries with it plain indications of its beneficial or harmful nature. All fruits such as the apple which bear the marks of the blossom are to be eaten and all which do not are to be avoided. Such methods of distinguishing between the good and bad, however, are unreliable for there are nearly as many edible fruits that do not bear the

marks of the blossom as there are fruits that do. Witness the cherry, plum, peach, tomato, gooseberry, currant and grape, to say nothing of such wildings as the mandrake, the cranberry and the elderberry. The one fact underlying this matter is that in temperate regions, the two families of plants that give us most of our edible fruits, happen to be the rose and heath families, both of which bear fruits crowned with the remains of the blossom. But in both these families there are fruits like the choke-berry (*Aronia nigra*) and the squaw huckleberry (*Vaccinium stamineum*) that are inedible.

The question why the general public should prefer articles of this kind to less startling and more truthful information is one that deserves more than a passing thought. It would seem that it cannot be ascribed entirely to ignorance, but has a deeper psychological origin inasmuch as mankind has always turned a credulous ear toward marvellous stories of plants and in their beliefs endowed many of them with supernatural powers. The legends of the mandrake and the elder of the mystic fernseed and the wonderful spring wurzel that would open any lock, are instances of beliefs once current. And while we no longer accept such stories for the truth a large number of people still hold to ideas concerning plants that are almost as incredible, or exhibit a willingness to believe extraordinary stories about them that is most surprising.

BOOKS AND WRITERS.

The reviewer rarely comes upon a book devoted to sciences other than botany that he cares to recommend to his readers, but in the case of Samuel J. Hunter's "Elementary Studies in Insect Life," published by Crane & Co., Topeka, Kansas, he feels that such a recommendation is not unwarranted. He does not remember to have seen a book devoted to insects that contained a greater number of related facts and that was written in a more charming manner than this one. The book is not a manual for identifying insects, although it contains an excellent key to the orders and principal families, but aims rather at developing some of the biological problems presented by the insect world. Such sub-

jects are treated as metamorphosis, the special senses protective devices, solitary and social life, instinct, relation of plants and insects, friends and foes, the wealth of insect life, the habits of ants, form and function, etc., in all of which there is a vast amount of information of a character that those who are not entomologists will find it advantageous to know. There are two colored plates and 232 other illustrations, a large number of which are photographs from life. Many of the statements will be interesting to botanists aside from their entomological bearing as the one that records that it is sometimes difficult to obtain verbena blossoms because they are torn to pieces by the milkweed butterfly in withdrawing its proboscis from the flower; or that the grasshopper which spends much of its time on the lambs-quarter (*chenopodium album*) is marked with red, like the leaf. The one thing that will attract all plant lovers is the account of the pronuba moth fertilizing the yucca which is illustrated by flash-light photographs of the operation. The practical value of the book is exhibited in such parts as that devoted to injurious insects and how to deal with them and instructions for collecting and preserving specimens. The volume contains 344 pages and costs $1.25.

Aspects of the Forest in Winter.--On the whole, winter is a far better season for walking in public parks than summer is. One sees much more of the broad scenery when the leaves have fallen. I need not say that the winter aspect of a forest, after a fresh fall of snow, or after cold rain has frozen upon every twig and lingering leaf is one of extraordinary beauty. Less understood is the beauty of bare trees, of the half frozen brook and of the blue shadows on the fields of snow.--*President Eliot of Harvard in Park and Cemetery.*

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